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The OIL WEEKLY

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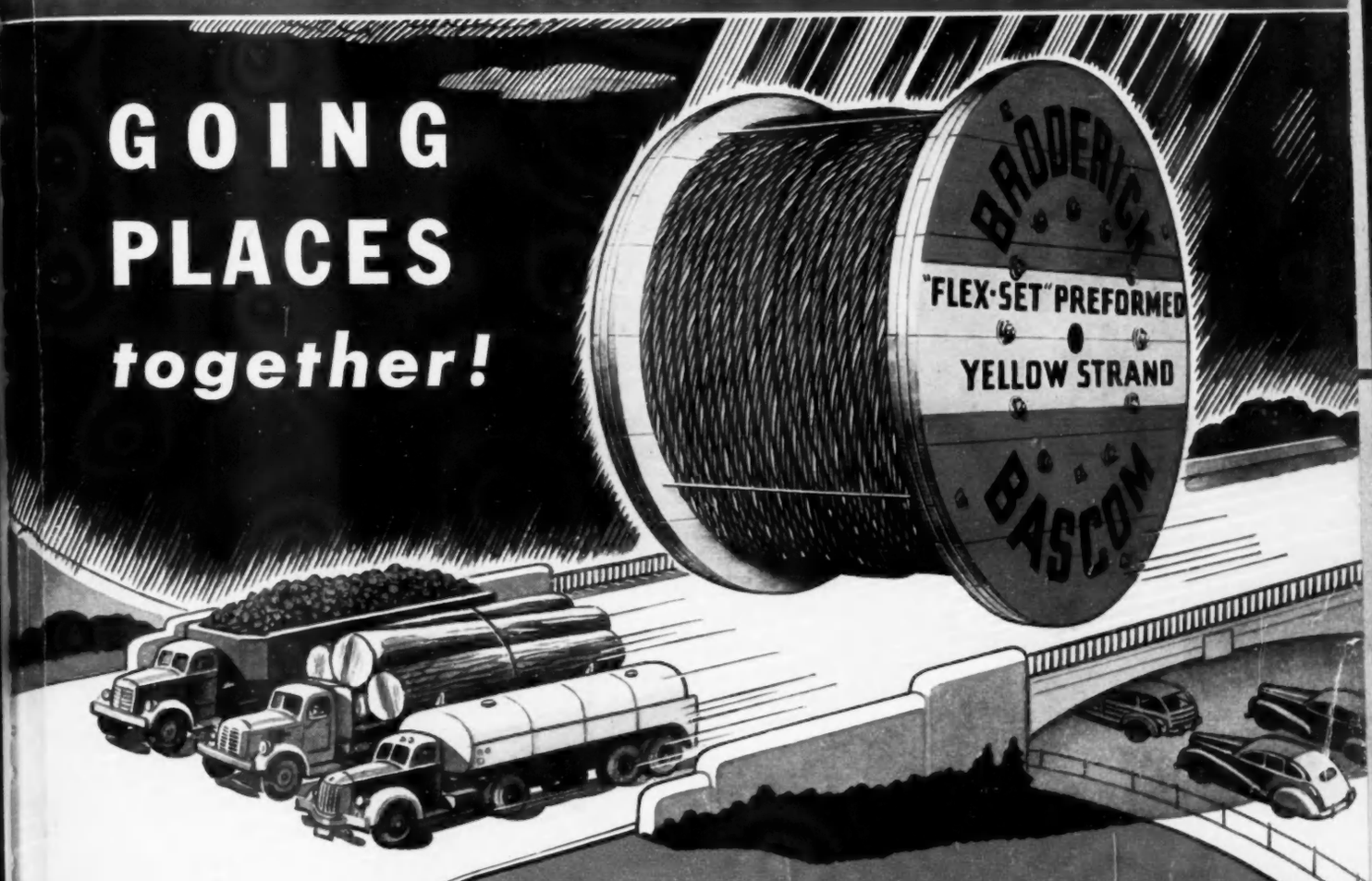

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LOOKING AHEAD
. . . with the Editor

OIL men have conceded that large quantities of petroleum probably underlie the ocean beds of the world. Several possible oil-bearing structures already have been located off the shores of the United States. Some geologists believe the Gulf of Mexico to be the world's greatest oil storehouse.

With these structures already spotted, the problem now is to develop the right kind of method for tapping this oil.

One plan for drilling beneath the ocean is the Shrewsbury Sub-Sea Well Drilling Column, which was proposed to the Department of Commerce as a war measure in November, 1942. This drilling column was designed by R. D. Shrewsbury, consulting engineer to Design Engineering Company, Tulsa.

Many details of the device are still in the formulative stage, but the fundamental principle is as simple as a bottle floating upright in water, Shrewsbury points out in an article describing this drilling column. This article will appear in a forthcoming issue of THE OIL WEEKLY.

THE series by Hubert Guyod, Houston well logging consultant, published last year in THE OIL WEEKLY gave a rather detailed discussion of the principles underlying Electrical Well Logging. The aim of the present short series beginning on page 33 is to show how these data can be put to practical use for the location of petroleum reservoirs.

For the sake of completeness it has been necessary to summarize some of the discussion offered in the first series or to repeat a few figures. These occurrences are rare.

The result of some recent research has been embodied also in the present work, so that this treatment, although much simplified, is an up-to-date presentation of electric log interpretation.

The OIL WEEKLY

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SIMPLICITY IS THE FIRST REQUISITE OF SAFETY

Look for the strains that aren't there!

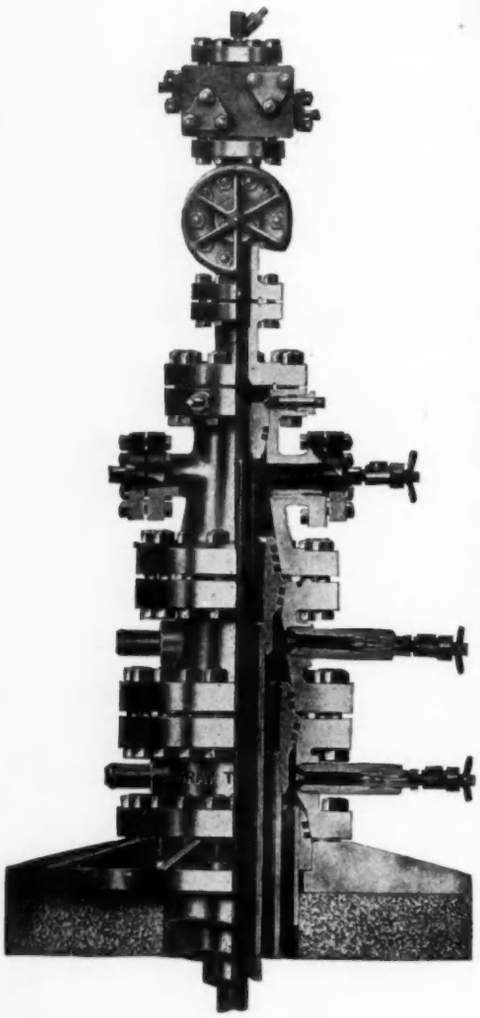

FIGURE 1A

Complete Well Head Assembly equipped with Composite Manifold, Valve Removal, Installation and Removal.

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Those who have accomplished the improvements of the past made mistakes, and tried again. Having made mistakes proves the virtue of having tried, but repetition of errors is folly. To avoid repetition, a designer must have full knowledge of the history preceding his efforts.

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The whole is greater than any of its parts.
Look for the strains that aren't there!

THE WHOLE IS GREATER THAN ANY OF ITS PARTS

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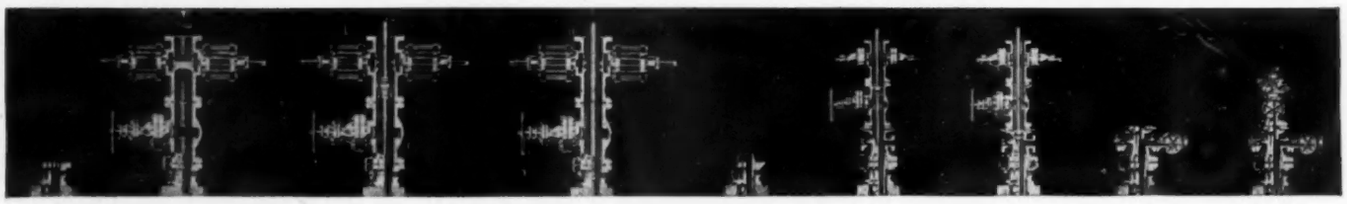

Casing Head Attached | Drilling | Running Casing | Casing Landed | Drilling Control Equipment Removed | Drilling-in and Running Tubing | Tubing Landed | Control Equipment Removed | Manifold Attached

The Outlook

Postwar federal expenditures will be much greater than originally anticipated and may necessitate a narrowing of the proposed 1946 tax reductions. Further relief for corporations beyond that provided in the recently enacted revenue bill is becoming doubtful.

* * * *

The international situation, far from satisfactory, may prove difficult to work out. Russian resistance to the efforts of the Iranian government to deal with its internal disorders may well cause worry on the part of American companies operating in that country. Russia, of course, seeks further oil resources. Washington plans a strong protest to Stalin but likely is unwilling to throw troops into the area to back up its position.

* * * *

Congress definitely is being held in leash from quick and stiff anti-strike legislation only by the heroic efforts of administration leaders. It is evident that the government will have to step in if it wishes to save long delay in reconversion.

* * * *

Price Administrator Chester Bowles reportedly is anxious to give up his post after the turn of the year, but efforts to keep him will be made by administration leaders who are fearful that his resignation would loose a drive for the ending of price control which would be irresistible.

* * * *

Government officials would welcome a continuance of the PIWC, modified to meet peacetime conditions and the requirements of the Department of Justice. Secretary of Commerce Wallace would use industry committees in working out his policies. From the standpoint of the oil industry, it would benefit by having an authentic spokesman in Washington. Government interest in continuation of wartime cooperation was evidenced last month when the administration asked the motion picture industry to continue its committee.

* * * *

The fate of the synthetic rubber industry is no clearer than before, as a result of the failure of the international study group which met at London last month to make any recommendation with respect to its treatment. The group's report, however, indicated a belief that the industry should be left to find its own level in competition with natural rubber from the Far East, which will begin to move in volume again next year.

* * * *

An Eastern manufacturer claims a process whereby synthetic crepe rubber shoe soles are made much tougher and hardier than those made from crude rubber. This may offer a new outlet for the synthetic plants built during the war at great expense.

* * * *

Refiners predict a cut in the cost of home heating since catalytic cracking, which gave American automobilists vastly superior gasoline, results in fuel oil yields that contain more btu's of heat per gallon. This superfuel is expected on the market this winter.

* * * *

Central Railroad of New Jersey is considering a profit-sharing plan under which employes "automatically would be guaranteed the maximum proportionate share of the earnings consistent with continued operation of the business". Aim: to "utilize more directly the political power of our organized employes, to help bring about less legislative discrimination against the railroads and in favor of their governmentally subsidized competitors".

* * * *

Some Mid-Continent oil operators, chanting "charity begins at home", believe they should be given preference on new trucks and other field equipment, much of which is being siphoned out of the country to foreign fields.

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Wall Scraper

The Changing Panorama

Holman Views Future Oil Supply of World

GEOLOGISTS agree that more than 150 billion barrels of oil still remain to be found in the Western Hemisphere, and it is generally thought that about 50 billion barrels of this will be discovered in the United States, Eugene Holman, president of Standard Oil Company (New Jersey) states in an article in *The American Magazine*.

He declares that 150 billion barrels is enough supply to last for another 100 years at the present rate of consumption, but also indicates that a 100-year supply is not enough—in fact, is actually a shortage—since it would mean that the automobiles and airplanes of our grandchildren would be stalled for lack of fuel. Holman reminds the public that crude oil is not the only potential source of gasoline. He said the present 40 percent gasoline yields could be increased to 80 percent and higher. Also he pointed to present-day research which indicates gasoline may be produced from coal when the need arises at a refinery cost of as little as 10 cents per gallon.

Underwater oil deposits are of prime importance, Holman said, citing the fact that one of the world's greatest sources of oil lies beneath the surface of Lake Maracaibo in Venezuela.

In predicting an additional 50 billion barrels of oil yet to be uncovered in the United States, the oil executive explained his estimate by a review of the favorable unexplored area in this country. Of the 2.5 million square miles of sedimentary rock to be found in the nation, 1.5 million square miles are generally believed to be favorable for oil accumulation, and not more than one-half of this favorable territory has been thoroughly explored, he said.

Holman listed states considered favorable though as yet non-productive as Arizona, Delaware, Georgia, Iowa, Massachusetts, Maryland, Minnesota, Missouri, New Jersey, Oregon, North Carlina, South Carolina, North Dakota, Utah, Virginia, and Washington.

He paid tribute to American technicians in citing that with only 15 percent of the world's favorable oil territory, we have produced more than twice as much as the remainder of the world combined.

When more oil is needed, Holman thinks we will find it.

We have a period of grace of about five years in which to solve this problem of how to live in peace with our neighbor nations in a world of atomic bombs. If we fail, civilization fails. If we succeed, your children and mine will climb to new heights on the scale of civilization.

—DR. C. G. SUITS, *Vice President*, General Electric Company.

Leasing Act Change And Oil Scarcity

SENATOR O'Mahoney is absolutely right in his statement that the nation's oil leasing act is badly in need of amendment even though some of the "leads" that Washington reporters wrote on the story insist on adhering to the old bogey of "the nation's oil barrel is running low."

No one, of course, will question the need for a continuing intensive search for oil reserves and no debate will be initiated by the oil industry that a general overhauling of government leasing rules will help. So there was little need at this point for the scarey tale about oil scarcity, an account which the industry's technologists (for example, see Dr. Robert E. Wilson's article "Oil for America's Future" in THE OIL WEEKLY October 15, 1945) have pretty well discussed and answered.

However, reasons given by Senator O'Mahoney for the current effort to amend the leasing act are in most respects quite sound. Hear:

"The United States drew heavily upon its reserves of petroleum for war purposes, using more than 1,000,000 barrels daily in excess of normal production.

"Great new deposits of oil have been developed in the Middle East, particularly in Arabia. Estimates of reserves there are in the hundreds of millions of barrels.

"Several American companies have interests in the Middle East. But if the United States is to continue to be self-sufficient in its resources of energy—which are the basis of all industrial prosperity—we must not only promote the manufacture of liquid fuels from coal and oil shale, but we must also adopt a policy for the exploration of oil and gas upon the public domain that will stimulate the search for new deposits.

"Congress during the war enacted my bill to provide flat royalties of 12½ percent for 10 years as a reward for finding new deposits. That law was successful and substantial new deposits were discovered.

"It is equally important in the post-war period that we continue to stimulate exploration, because we need future reserves of petroleum now just as much as we needed increased production for war.

"Therefore, the leasing act relating to the public domain should be modified in the manner suggested in the bill which Senator Hatch and I have introduced, to eliminate all obstructions, administrative and otherwise and establish royalty concessions to create an incentive for development."

Senator O'Mahoney is on the right track in his effort to make leasing contracts more attractive. J. Edgar Pew, in a statement before the Senate Special Committee Investigating Petroleum, hit the nail pretty well on the head recently when he said:

"This country possesses hydrocarbon resources sufficient to meet this nation's requirements for oil products for generations to come, provided that adequate incentives for the exploration and development of these resources are permitted free of unnecessary restrictions."

Molasses, Too!

BESIDES transporting oil, the tanker was a "jack-of-all-trades" during the war just ended.

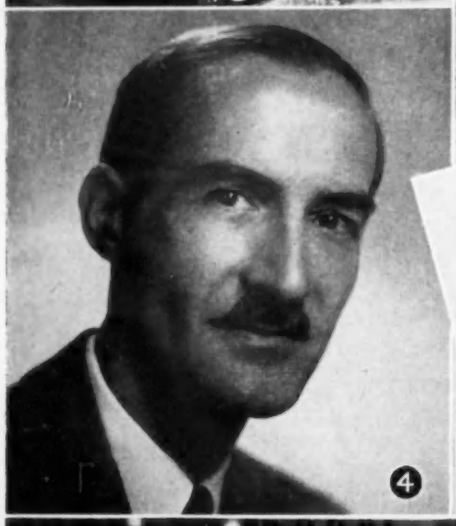
A fleet of 21 tankers operated during the war by Cities Service Company transported more molasses than petroleum products, such as gasoil, kerosine, heating oil, creosote and benzol, between December 8, 1941, and July 3, 1945.

Besides molasses other non-petroleum products transported by the fleet during the war included 562 Army and Navy planes, 65 gliders, 32 landing craft of various types, seven torpedo boats, a number of smaller vessels and more than 250 trucks, trailers and tractors. Other items included 750 cases of spare parts for the Air Corps, 224 crates of belly tanks, 1013 cases of USO canteen supplies and 4242 bags of mail.

The fleet did a big job performing its assigned tasks, transporting more than 55 million barrels of bulk petroleum products including crude oil, fuel oil, gasoline and diesel oil.

Similar fine records were made by other marine divisions of major oil companies.

THE NEWS IN PICTURES



1. A 27-foot well that will simulate conditions in a regular 10,000-foot bore hole is being built at Dowell Incorporated's Tulsa experimental center. The hole will reproduce conditions in the last 30 feet of a deep well at 300° F. and working pressure up to 10,000 pounds per square inch. Within the bore will be a giant "test tube" in which Dowell will study reactions of electrical instruments and plastics.

2. Humble Pipe Line Company officials gathered at the Houston municipal airport to greet the first plane scheduled for pipe line patrol duty between Baytown and McCamey. Left to right, Pilot R. R. Roberts, Assistant General Superintendents H. M. Stevenson and F. C. McMahon; A. E. Payne, superintendent of the Southern Division; and F. O. Perry, district superintendent at Pierce Junction.

3. A now-it-can-be-revealed apparatus is the Army's mine-detecting jeep The vehicle is driven along roads or across fields and when the large box in front of the jeep passes over a mine, electrical devices actuate mechanisms which lock the brakes and release the clutch, stopping the jeep before it can run over the mine.

4. Designer of the mine-detecting jeep is H. G. Doll, chairman of the board of directors and director of research for Schlumberger Well Surveying Corporation, Houston. Doll also originated an idea which, when converted into equipment by Owen Huston and others of Electro-Mechanical Research, Inc., located a treasure of $8,500,000 in silver coins in 110 feet of water in Manila Bay.

5. Witnesses at the recent O'Mahoney Senate committee hearing in Washington were Brig. Gen. Howard Peckham, Fuels and Lubricants Division, Army Quartermaster General Corp, left; Capt. C. P. Franchot, petroleum liaison officer, Adjutant General's office, U. S. Navy, right; and W. Alton Jones, president of Cities Service Oil Company, standing.

The Week's News

WINDING up the final installment of its five-months-series of hearings on the world oil situation, the Senate Special Petroleum Committee last week heard pertinent comment on the past, present and future of oil from Administrator Ickes and Deputy Administrator Davies. Now left for consideration, probably after the turn of the year, is only the position of the independent oil company. Story below.

Synthetic Rubber—The future of the United States synthetic rubber industry is a question to be dealt with exclusively by the United States, it was indicated by an international study group which met last month in London. The group's report, predicting a tremendous oversupply of rubber within a year, made no recommendations or suggestions on the part to be played by the new synthetic industry. Page 30.

Synthetic Fuels Laboratory—The Bureau of Mines gets a short-cut on its program to develop commercial means of producing liquid fuels from coal, shale and other materials in the shape of a transfer of the $17.5 million Missouri Ordnance Works plant to be a demonstration center, saving several millions of dollars and many months of time which would be required to build a special plant. Page 30.

Public Land Lease Extension—Congress will again approve a one-year extension of outstanding oil and gas leases on the public lands, but for the last time, it was brought out in House debate on the extension bill. Page 32.

Tidelands Controversy—The California Tidelands fight continues in the public print, one side presented by the "exposé" in the *St. Louis Post Dispatch* and the other flowing from the pen of California's Attorney General Robert Kenny, whose last installment was a 39-page statement "for the public." Page 31.

Refinery Strike Fact Finding—The government is making another effort to settle the oil refinery strike and pave the way for return of more than 50 plants to their owners. A three-man board set up by Secretary of Labor Schwellenbach will act in a fact-finding capacity, with both union and companies committed to acceptance of its findings—but will they?

International Petroleum—Mexico City hears that a "temporary rental" plan for oil development by U. S. companies is in the making. Page 30. Oil operations continue normal in the Middle East despite trouble in Iran. Page 32.

Authority Over Oil—Secretary Ickes favors centralization of authority by government agencies over oil, warns against having to go through military agencies. Page 29.

Resources Council—Senator McCarran has proposed establishment of a council to make a national inventory of natural resources. Page 32.

PIWC Meeting—Postwar organization of the oil industry for continuance of the partnership with the federal government will be considered at the final PIWC session. Testimonial dinner planned for William R. Boyd, Jr. Page 32.

Competitive Industry Stressed by Ickes and Davies Before Committee

Despite the terrific drain of the war years there is no danger of the United States running out of liquid fuels in the foreseeable future, but the discovery and development of adequate and continuing supplies must be handled by private competitive industry, with the help of the government but without unnecessary regulation, Petroleum Administrator Ickes told the Senate Special Petroleum Committee November 30 as it prepared to close its review of PAW operations.

With Deputy Administrator Davies, Ickes outlined the things the two PAW officials believe necessary to a successful maintenance in the postwar world of the position which has been carved out at home and abroad by domestic operators.

Ickes was emphatic in his assertion that the industry-government partnership developed during the war should be continued.

Understanding with Government

"Minus the regulations and restrictions which war made necessary," he said, "there needs to be a continuing understanding between government and industry on many fronts—an understanding which will recognize both private interest and public concern. There are jobs that are properly solely those of the industry, and concerns that are properly those of government."

Both officials also stressed the importance of the small independent operator, Davies particularly reverting to that theme frequently and pointing out that most of the important companies of today were small independents less than a generation ago.

Also of pressing need for the benefit of the industry is the concentration of government administration, now scattered among a number of agencies, Ickes told the committee.

"The war has proved to me, and I hope to the citizens and industry of this country, that in war or peace the United States has only one oil barrel," he said. "We found out by bitter experience that it does not make sense to operate under a lot of conflicting jurisdictions and regulations that clash and bewilder harrassed individuals and confound an oil industry willing to cooperate with a government at bay to defend a continuance of our democratic system. Why pretend that there are such separate items as civilian oil, war-plant oil, transport oil, Air-Force oil, Army oil and Navy oil all wrapped into separate packages? Will someone tell me why it makes sense in this age of total war to operate naval petroleum reserves that were set up, without much foresight, for the exclusive use of our Navy and make no similar provision for our own modern Army and Air Force?"

Major needs of the country and industry today, Ickes declared, are: stimulation of exploration to get new sources of productive capacity; efficient use; advancement of technology in finding and developing oil resources and in refining, and assurance of access to foreign resources to supplement domestic production as needed.

"In addition," he added, "I have suggested from time to time that we would do well to stockpile oil products, both at home and at strategic points throughout the world, so that we shall have the oil where we need it, when we need it. I am not proposing that we attempt to build up sufficient stores of oil products to fight an entire war. At the same time it would not be feasible, if indeed possible, to set aside sufficient underground government reserves so that the full needs of a major war could be supplied from them. My thought is, rather, that the nation needs to have sufficient reserves, regardless of their ownership, so that we may have that extra productive capacity which we have seen that we need to meet emergency peak requirements. We also need sufficient available supplies to take care of our wants until we can step up our productive capacity.

Develop Adequate Production

"I am not advocating any wild and unrestrained program of stockpiling or of acquisition of government reserves. My conviction is that the future security and standard of living of this nation depends, in oil as in almost all else, not upon negative measures, but upon the development and maintenance of adequate, efficient productive capacity.

"I see no inconsistency, however, in declaring my belief that there must be a recognition of national interest in our oil resources. By this I mean that the government must make certain that for whatever needs the future may bring, it will have all of the oil that it requires, where it is required and when it is required."

Ickes said that development of the

"Study Foreign Oil Stockpiling"—Ickes

Liquidation of PAW has made it impossible for that agency to study the matter of the economics of underground stockpiling of foreign oil, but "somebody" ought to be studying the subject, Secretary Ickes said November 29. Ickes also admitted that tear sheets of the tidelands expose running in the St. Louis *Post-Dispatch* have been distributed to state attorneys general from the department, but said he did not know whether any of those officials had changed their minds.

Respecting the matter of tidelands ownership, he commented briefly on the California conservation situation, saying it was "perfectly scandalous" and, adding, "the position of certain oil interests in California on a conservation bill is something worse than scandalous."

The secretary revealed that the question of stripper wells is meeting with further study in the department, and he had been advised a memorandum on the subject was on its way to him from E. B. Swanson, director of research. He pointed out he has always been a strong supporter of the stripper well operators and had made many efforts on their behalf to get a price increase on crude.

public domain deposits is of immediate moment to the government, as well as that of lands acquired by the United States and in the continental shelf. The government, he said, should take an active part in aiding and encouraging the search for new fields and the establishment of sufficient reserves to constitute a safety factor in case of war. To that end, he suggested, the government might participate in the exploration of its own land, particularly in areas or regions where private industry operations would not be justified or where the national interest requires such action.

But he emphasized, "I do not believe that government should compete with private industry where the latter is going strong nor that it should engage in the business of producing oil for profit, but there are instances where governmental participation in actual prospecting for oil is desirable."

Ickes also took occasion to defend the Anglo-American petroleum agreement which, he said, is "not an end in itself," but merely a step "toward orderliness fair dealing and peace in the conduct of the international petroleum trade."

Foreign Reserves

"Foreign oil reserves under American control are of increasing, enormous potential interest," Ickes said, declaring that the government should never foreclose any opportunity "wherever and whenever Americans can retain and expand its holdings and make new developments.

"Nevertheless, leaders of the oil industry of the United States realize that in the world of today they need the encouragement and assistance of their government. As oil becomes increasingly a matter of world-wide importance, our nationals will necessarily encounter the increasing activity, not merely of rival companies, but even of foreign governments. It is not too much to expect that, until we have a petroleum agreement among interested nations, some American companies will find that they are being forced out or are being so circumscribed in their activities that their survival is threatened on the other hand, it is possible that, with the proper assistance and encouragement of this government, our companies operating abroad, will be immeasurably strengthened, and that we will be able the better to contribute to world-wide security and amity.

"I do not think that we are going to 'run out of oil' unless we permit ourselves to run out," the secretary concluded. "There are so many sources of liquid hydrocarbons that we can avoid running out. I think that we must develop our domestic productive capacity in every possible way. I believe that we must master the art of synthetic liquid-fuel manufacture. And, as I see it, we must assure ourselves of access to foreign oil resources. We just can't take any chance of not always having enough of it."

Atomic Energy

Davies made two appearances before the committee, initially to introduce the presentation and again to give his views as to the future course of the industry and the government. He expressed the belief that atomic would find its first industrial application in power plants where it would replace residual fuel oil and gas, but pointed out that residual fuel oil is becoming less and less important in the industry and may not long be a major product, while the gas industry is likely to concentrate in the future on special products, such as motor fuel.

The deputy administrator agreed on the necessity for strong and continuous governmental support of our nationals operating abroad, declaring that to have vigorous oil activity abroad the government must secure equality for its nationals and insure that no new and unreasonable demands be made upon them, that they are secure from confiscation and under no discrimination with respect to payments, exchange, and the like.

Davies said also that Petroleum Reserves Corporation, now converted into War Assets Corporation as a vehicle for the disposal of surplus government properties, should be divested of charter provisions enabling it to go into the oil business so that it will not "breed suspicion and distrust."

Davies related to the committee that requirements for crude dropped after the war but not to prewar levels and present estimates indicate that 1946 demand will be higher than that of 1942 or even 1943, and that by a year from now demand will again be rising, passing peak wartime levels "within a very few years."

"Unless we are to curtail our use of oil or radically increase imports or resort to higher-priced sources of production including synthetics, we must somewhat reverse the downward trend of discovery," he said.

Some help will come from improved geological, geophysical and geochemical techniques, he added, but, he said, "the most effective stimulus, of course, is an adequate price for crude."

"If enough exploratory wells are to be drilled the small wildcatter must be kept in business and kept drilling," he explained. "The large companies, with all their resources, do not have enough risk capital to drill all the wells that should be drilled. Their final decisions on what spots to drill are made by too few men; they do not represent a sufficient diversity of opinion."

Davies also recommended conservation legislation in states not now having such laws, suggesting a federal statute if the states themselves do not act.

He singled out particularly California and Illinois which, he said, "should have had conservation laws long ago." Wartime conservation under PAW directive is admitted by production engineers to have brought California production practices to "higher scientific levels, with greater fairness to all operators, than had ever before been experienced."

"I believe in the control by each state of the resources within its borders," he commented. "I should oppose any extension of federal regulatory authority to such resources unless all other means fail. Waste of oil within any state may affect the availability or price of oil products in other states."

Statute vs. Voluntary Rule

Voluntary agreements by operators for conservation do not work because such a program "is at the mercy of any reckless or greedy operator who may choose to violate it," he said, and in addition, many operators hesitate to join such agreements because of fear of prosecution under the anti-trust laws. He favored a statute relieving from anti-trust prosecution agreements among operators for the purpose of preventing waste of oil or gas.

Davies predicted that as world markets re-open and men and materials become available, an upsurge of foreign developments will occur. From time to time, he made reference to what had happened abroad as the United Nations contributed their oil to the war effort, but he always excluded Russia. Questioned, he explained that it was impossible to get information from the Soviet even though "we were giving such support to the Russians."

"I am still asking the questions and I am still not getting the answers," he added.

Satisfactory disposal of the 24 100-octane plants built by the government will be a "complex problem," the deputy administrator said, but there need be no fear that we are burdened with a great excess of refining capacity, since demand for products shows no sign of dropping to prewar levels and the war-built facilities were designed to increase the

yields of specific products and increased crude throughput capacity very little.

He said it was doubtful that the country now has an economical throughput capacity more than 10 percent above present needs, and pointed out this is less than normal excess capacity, and within two years or less demand for products is expected to increase more than 10 percent.

Davies emphasized the position of natural gas, pointing out that while great volumes were used during the war, even more was found and current estimates of known reserves are almost two-thirds greater than in 1941.

Future of Natural Gas

"The known reserves of gas in the United States, in fact, even at the conservative figure of 135 trillion cubic feet, exceed in energy value the 22.2 billion barrels in the known reserves of oil." he said, adding that the time appears to be approaching when gasoline may be synthesized from dry gas at costs competitive with those for producing gasoline from oil and natural gas therefore may add greatly to our reserves from which motor and aviation fuels will be available at reasonable costs.

As to the Big Inch pipe lines, Davies emphasized "they helped to win a war and have repaid in money a large part of their cost; in service rendered they have repaid their cost many times over. In considering their use or disposition, therefore, they need not be looked upon as owing us anything."

Throughout his statement, Davies emphasized the determined and successful efforts that had been made by PAW to maintain the competitive position of the industry and stressed the fact that the independent and small operator, with the end of the war, found themselves still in the ring.

"The industry joined the government in a dynamic partnership; it incurred the risks and made the sacrifices for which the partnership relationship called; it produced, transported and distributed unprecedented quantities of petroleum products; it made a major contribution to the winning of the war."

Commenting on Davies' presentation, Chairman O'Mahoney warned that "we must plan for a free economy if we are not to be driven into some form of controlled economy."

Following Davies, men who had headed the various divisions began a presentation of what the deputy administrator called a "final account of our stewardship," leading off with H. Chandler Ide, executive assistant to Davies, who outlined the organization and programs of PAW, and Howard W. Page, director of the program division, who explained how the needs of the military and the civilian population were met. The report of Walter Hochuli, director of distribution and marketing, was also presented.

Reporting on wartime production problems, Philip H. Bohart, director of the production division, emphasized Davies' remarks on the need for continued drilling and for an adequate crude price which will make it possible. Adequate price also is essential to the continued operation of the high-cost well, Bohart declared, explaining that 88 percent of the 408,000 producing wells are pumping and only 12 percent are flowing.

"Both the low-cost and the high-cost production are needed and the shutting-in or abandonment of a substantial part of the high-cost production would affect reserves and productive capacity, both of which should be kept at a maximum."

Heroy's Testimony

Possibilities that world oil demand for maybe as long as a year or two may recede to prewar levels were seen by William B. Heroy, director of the foreign production division.

This condition, he said, will not be due to United States demand, which will continue heavy, but "it will be sometime before European countries whose internal economy has been disrupted by the war, will return to a normal level of consumption."

Any postwar adjustments in world petroleum supply, resulting from reduced world requirements, should be so distributed that the economy of foreign countries in which petroleum is an important industry shall receive reasonable recognition and their local petroleum industries shall continue in a healthy condition, he contended.

Refining Trend

The capacity of world markets to absorb refined products also will be a major factor in the probable future trend in construction of foreign facilities, it was pointed out by S. Stribling Snodgrass, director of the Foreign Refining Division.

"Overshadowing the whole field of postwar refining abroad is the question whether basic economic factors will be allowed their natural play, or to what extent they will be inhibited by nationalistic legislation, state competition, tariffs, foreign exchange restrictions, importing licenses, and other artificial restrictions," Snodgrass said. "Before the war there was a strong tendency toward artificial regulation of refining operations."

Postwar Gas Expectations

Continued expansion in the use of natural gas and its products for fuel and power; further conservation and reduction of waste, a continued high discovery rate, and greater use of gas in the manufacture of synthetic chemicals and plastics are the postwar expectations in the field of natural gas, it was testified by James E. Pew, director of the Natural Gas and Natural Gasoline Division.

"Present evidence indicates that we may expect a continuation of the upward trend in known recoverable reserves," Pew stated. "A factor contributing to this upward trend in gas discoveries is the greater depth to which wells are now being drilled in the search for oil. Past experience has shown that the greater the depth of drilling, the greater is the likelihood of gas discoveries.

"Now that wartime restrictions have been removed and some of the extremely high oil producing rates can be curtailed, real progress should be attained in further reducing gas waste."

Important factors in gas conservation he explained, are adequate price and markets, "lack of which has been responsible for much oil field gas waste in the past." California, he said, furnishes an outstanding example of how these two factors can conrtibute to the elimination of waste and the efficient use of oil-field gas, favorable markets with adequate prices having reduced the waste of gas to a negligible amount.

Ickes Would Avoid Military Agencies In Centering Government Oil Activity

Reorganization of the government establishment provided for in legislation now pending in Congress, may serve to produce the number of agencies now exercising authority over oil, currently numbering in the neighborhood of 30, it was declared November 29 by Secretary Ickes.

Ickes explained he did not believe there should be any form of oil agency on the cabinet level, and suggested that all activities could be centered in his department.

The secretary commented on the frequent efforts which are made to transfer some of the oil activities of the department to other agencies. Asked whether that included the military, Ickes pointed out that he never was consulted about the Army's abortive Canol project.

"There were a lot of things we were not consulted about," he added. "We never were kept advised of the stock position of either the Army or Navy. We did not know how many of our tankers were being sunk during those troublous days when we didn't know whether we were going to be able to get enough oil to keep the war going or not.

"But," he concluded, "we knew pretty much what was going on, because we found out from the British."

Ickes declared that in its dealings with the government, the industry should not be required to go directly to the military agencies.

"It is essentially a civilian operation and first, last and all the time, I believe in civil administration of civil affairs. It would be a sad day for this country when we feel we have to turn to the military to run affairs that are essentially civilian."

Huge Rubber Piles Seen With Keen Natural vs. Synthetic Competition

Anywhere up to 600,000 tons of natural rubber may reach consuming nations from the Far East next year, sparking a postwar competitive fight between natural and synthetic, it is disclosed by a report of the international rubber study group which met last month in London.

The report carried no recommendations whatever for production control among the countries producing natural and synthetic rubber, nor any suggestion for the postwar treatment of our own synthetic rubber industry, which represents more than two-thirds of the world's synthetic productive capacity.

The group, however, did forecast a huge world surplus of rubber in the near future, pointing out that maximum requirements for the next few years will be possibly 1.5 million tons annually, against which the United States can produce more than 1 million tons of synthetic and the rest of the world 400,000 tons, with Far East shipments of natural running a half-million tons or better next year and capable of reaching 1.5 million tons.

The result of the competition between natural and synthetic rubber, the report intimated, may be the development of a variety of new uses for the product. For many products, both new and old, it may be possible to use either type of rubber effectively, with a choice probably based on relative costs, while for others either one or the other may be preferred because of its special qualities.

The study group estimated that between 200,000 and 300,000 tons of rubber were available in the Far East at the time of its liberation, but made no forecast as to how much of this will be exported immediately.

Co-Op's Oil Operations Described at Convention

Petroleum products played a major role in boosting both net savings and volume of business of the Consumers Cooperative Association, Howard A. Cowden, president and general manager, reported to shareholders at their annual meeting last week in Kansas City.

The cooperative announced purchase of Wolf Creek Oil Company of Wichita, Kansas. Forty-six wells, producing 1100 barrels daily, were included and bring to 436 the total number of producing wells owned by the association.

Net savings of $1,766,507 of a volume of business totaling nearly $27 million, were reported by Cowden. Of the total volume, more than $17 million of it came from the association's own factories. The cooperative, which owns three refineries and an interest in a fourth, will now be able to produce 25 percent of its crude oil requirements, Cowden declared. Last year it marketed 21,544 carloads of refined fuels to 907 member associations in nine states.

Delegates heard a report from Cowden on his recent trip to London where he proposed the establishment of a world oil cooperative at a meeting sponsored by the International Cooperative Trading Agency. A committee of five has been named to complete incorporation of an international petroleum co-op, probably in 1946, he said.

Plant to Provide Quick Work on Synthetic Fuels

The Bureau of Mines will take over the $17.5 million synthetic-ammonia plant of the Missouri Ordnance Works near Louisiana, Missouri, for conversion into a demonstration plant for the production of gasoline and oil from coal and lignite.

Secretary Ickes pointed out that the transfer will save the government the several millions of dollars involved in the construction of a special plant and speed up the synthetic liquid fuels research and demonstration program. Many of the ordnance plant's facilities and equipment can be used handily.

The plant consists of a number of fully-equipped buildings and facilities on 390 acres of land within easy access of the major coal fields of the country.

Two processes for the production of synthetic fuels will be studied, one the direct hydrogenation method and the other the indirect gas synthesis process. Each unit will have a daily capacity of 200 barrels of oil or the primary products, which include gasoline and wax as well as light and heavy oils.

Mexican Paper Tells of Temporary Rental Oil Plan

Mexico City's newspaper "Excelsior" recently published a story under a New York dateline saying that several U. S. oil companies were awaiting response from the Mexican government to offers they had made to rent and operate properties in Mexico, with the Mexican government participating in profits.

The correspondent claimed to have dependable information, mentioned a possible understanding between the Mexican and U. S. governments on the matter, and predicted that contracts would be worked out.

The companies were said to have proposed to make substantial investments in developing Mexico's oil resources under 50-year leases, which would provide that on termination, the wells and all industrial machinery would become the property of the Mexican government. The plan was described as a temporary rental, with the government receiving a fixed percentage of profits. It was said to have been well received generally in New York oil circles, where it was regarded as practical and worthy of consideration by both oil companies and the Mexican government.

Snow Succeeds Barton

Harold G. Barton, formerly supervisor of oil and gas operations for the California region of the U. S. Geological Survey, has been transferred to Washington to assume the duties of chief of the oil and gas leasing division.

Leroy G. Snow, formerly supervisor at Roswell, New Mexico, has succeeded Barton as supervisor for the California region, and Foster Morrell, formerly deputy supervisor at Roswell will succeed Snow.

Brown Warns Against Central Board To Control Pollution of Waterways

The oil industry is making real progress in its efforts to control the pollution of waterways but in dealing with the question of pollution generally, Congress should bear in mind the peculiar problems of the oil industry, the House Rivers and Harbors Committee was told last week by Russell B. Brown, general counsel for the independent Petroleum Association of America. Brown explained that several methods have been developed to dispose of oil field brines without causing pollution.

"But at the same time," he said, "no one or all of these were entirely satisfactory or possible in some situations."

Brown warned the committee against legislative proposals before it to prohibit the disposal of waste into streams from any new source of pollution without permission from a board in Washington.

"That would mean that no new well designed to produce oil could operate until the board got around to examine the facts," he said. "For the five-year period preceding the war we drilled approximately 28,000 wells per year. We will need to drill more than that average in the future. A considerable number of them produce salt water in their early stages and practically all of them at some time in their lives. The board would be all too busy with other new sources of pollution to give the attention to oil wells required by the national demand for oil. I fear the problem would soon be one of disposal of applications rather than waste."

Brown assured the committee that the industry welcomes cooperative effort, but emphasized that it is alarmed at certain of the coercive features of proposed legislation.

Charges Speculators Seek Tidelands, Says Court Rule Won't Quiet Matter

California Attorney General Robert W. Kenny last week distributed in Washington a 39-page "statement to the people" on the tidelands legislation pending in Congress and the suit now before the Supreme Court, charging that government officials are atempting to grab not only the offshore oil lands below the low-water mark but also the far more valuable lands on the tidal shores.

California's pressure for quit-claim legislation and her opposition to the suit, Kenny said, are based, not on the 15 miles of her 1000 miles of coast line which contain oil wells but on her six major harbors from which the state derives three times as much in rentals as tideland oil pays in royalties.

Concern over the fate of their on-water investments also is the motivating reason for the support given the legislation by 45 other states, 51 port and harbor authorities and 408 cities, he declared, pointing out that only three states have any interest in off-shore oil lands.

"Divide Up and Sell"

Kenny charged also that "speculators who have done nothing but file an application" for a federal oil lease would be the primary beneficiaries of Secretary Ickes' fight to nationalize the offshore oil properties.

"These people," Kenny declared, "have, by reason of Mr. Ickes' assurances, been put in a position to divide up and sell off all the tidelands in California. The extent to which these 'interests' in federal leases have been sold and passed around cannot of course be known without a full investigation of all applications."

"Litigation has not settled the question in the past, nor will it in the future," he continued. "The idea that the Supreme Court can render one quick decision that will quiet titles to all tide and submerged lands on all the coasts and in all the bays, harbors, lakes and rivers in the United States, is so far from reality that it must have been advanced merely as an attempt to block the pending legislation.

"If the suit against California is allowed to proceed and Congress does not act to quiet state titles, the federal government will be litigating with every state in the Union and hundreds of cities and port districts and thousands of corporations and individuals who are lessees or grantees from the states, for a generation to come.

"In the meantime, titles will remain under a cloud, all dealings in property and property interests which are dependent on the validity of state titles will be in a state of confusion, and harbor and coastal development retarded or indefinitely postponed. That is why the question should be settled now by Congress.

"Finally, it must be remembered that this legislation does not represent any move on the part of states to 'get' something away from the federal government, nor to change any settled relationship between state and federal authority, but rather a bona fide attempt to protect property which the states have always held and preserve the jurisdiction which they now exercise.

"It must be remembered too that the claims which make this action necessary are primarily the claims of one man (Ickes) who would confiscate property of untold value merely by changing his mind."

Export Rules Changed Relating to Petroleum

The Department of Commerce announced last week that, effective immediately, blockade control permits are no longer required for the exportation of petroleum and products to Spain, its possessions, or Tangier.

However, the department explained, individual licenses will be required for all shipments of crude or products in excess of $25 in value to any "Group E" country. The Group E countries include Spain, as well as Argentina, Austria, Bulgaria, Hungary, Italy and Roumania, together with a number of small islands and areas.

Crude Oil Production in the United States

(Estimates compiled by The OIL WEEKLY. All figures indicate daily averages, in barrels.)

STATE OR DISTRICT	PRODUCTION IN WEEK ENDED Dec. 1	Nov. 24
Alabama	500	500
Arkansas	76,350	76,300
California	846,600	841,300
Colorado	22,300	21,250
Florida	125	150
Illinois	202,700	205,100
Indiana	13,450	13,500
Kansas	241,500	266,250
Kentucky	29,050	29,550
Louisiana	368,100	368,250
North Louisiana	74,500	74,650
South Louisiana	293,600	293,600
Michigan	46,250	46,000
Mississippi	52,250	53,150
Missouri	100	100
Montana	19,950	19,565
Nebraska	750	750
New Mexico	94,200	94,200
New York	12,950	13,600
Ohio	7,000	7,150
Oklahoma	385,800	383,600
Pennsylvania	31,000	34,600
Tennessee	35	35
Texas	1,892,950	1,892,950
Upper Gulf Coast	464,350	464,350
East Texas Field	316,000	316,000
Rest of Eastern Texas	127,500	127,500
Southwest Texas	300,250	300,250
West Texas	456,650	456,650
North Texas	147,250	147,250
Panhandle	80,950	80,950
West Virginia	7,350	8,200
Wyoming	97,800	97,550
Total United States	4,449,060	4,473,600

Louisiana-Arkansas Group Names Carmody President

Art R. Carmody, president of North Central Texas Oil Company of Shreveport, Louisiana, was elected president of the Louisiana-Arkansas division of the Mid-Continent Oil and Gas Association which held its 22nd annual meeting in Shreveport, November 27.

Other officers elected include: J. J. Frommer of Ohio Oil Company of Shreveport, first vice president; Joe T. Goodman of Gulf Refining Company of Shreveport, second vice president; A. H. Weyland of Arkansas Louisiana Natural Gas Company, third vice president; A. H. Tarver, independent operator, Shreveport, fourth vice president; C. H. Lyons, Lyons & Prentiss of Shreveport, fifth vice president; A. R. Campbell, secretary-treasurer of Mid-Continent Oil and Gas Association in Shreveport, executive vice president.

Approximately 60 members heard Clarel B. Mapes, secretary of the general Mid-Continent Oil and Gas Association of Tulsa, principal speaker, talk on petroleum problems which will come before Congress in 1946, including taxes, pollution control and tidelands.

Secretary Campbell reported 360 members and said the 400-mark should be reached when contributors completed their quota. He said that the organization had been invited to meet with the Revenue Code Commission of Louisiana to discuss tax matters "since the petroleum industry directly or indirectly furnishes more than half the state's tax revenue." The current free spending vogue made him predict that the industry's committee will have a serious problem on its hands at the next session of the Louisiana legislature.

Road Construction Soon to Start Under Federal Plan

A three-year road-building program, to cost $1 billion a year of which the federal government and the states each will contribute 50 percent, will shortly get under actual construction, it was reported last week by the Public Roads Administration.

Much of the initial work on Federal-aid highways will be the reconditioning or rebuilding of sections of older and more heavily traveled roads, but many entirely new projects are expected to be started before next summer, and the various states have plans for road construction of their own which eventually will run to another $3 billion.

Congress last year authorized an appropriation of $500 million annually for the first three postwar years, of which $225 million is for improvements on the Federal-aid system, $150 million for secondary roads, and $125 million for projects on the Federal-aid system in urban areas.

In addition, the act lays the groundwork for federal and state cooperation in the development of a national interstate highway system running up to 40,000 miles.

Continuance of Partnership With Government Chief Topic of PIWC

Postwar organization of the oil industry for continuance of the partnership with the federal government will be the sole major question to come up at the final meeting of the Petroleum Industry War Council December 11, when the wartime organization will wind up its activities with a testimonial dinner to Chairman William R. Boyd, Jr.

At next week's meeting a report will be received from the special committee appointed by Boyd to survey the possibilities of a peacetime organization which could act as spokesman for the entire industry on important federal matters.

Government officials, including Secretary Ickes, have expressed their approval of the idea that the major industries should continue at least through the reconversion period the organizations which acted as liaison with the administration during the war, in modified form, of course, to keep within the limits of organization activities set by the Department of Justice.

The position of the administration in this respect was made clear last month when Director John Snyder supported by a letter from President Truman, asked that the motion picture industry continue its cooperative committee. If the oil industry does set up a peacetime organization, however, it will be only after very thorough study of the field which it could operate in under the anti-trust laws.

There is a very considerable segment of the industry which frankly is afraid that such a council would, through its very existence, serve only to encourage new anti-trust prosecution, and in New York last week, retiring chairman of the District 1 Distribution and Marketing Committee Samuel B. Eckert, vice president of The Sun Oil Company, warned that the type of cooperation which the industry engaged in during the war in peacetime "leads but to collusion and collusion leads to jail."

Others of the industry, however, have expressed belief that the effective relationship established with the government during the war should not be allowed to lapse, and hold that there are many fields in which industry council could be provided to, and would be welcomed by, government officials without taking the industry into fields where it might run against the inhibitions of the anti-trust laws.

"Last" Extension of Leases On Public Lands Favored

Serving notice that it is acting for the last time, the House of Representatives last week passed legislation extending the term of leases on the public lands until December 31, 1946.

Pointing out that this is the fourth time extension legislation has been brought up, Representative W. Sterling Cole of New York protested that previous extensions had been granted because of war conditions, but now comes on the claim that drilling material and equipment is not available, and asked whether extension of leases were to be continued indefinitely into the future.

He was answered by Congressman J. Hardin Peterson of Florida, chairman of the Public Lands Committee, who explained that the present situation is difficult but was expected to clear up within a year, so that, while it is difficult to anticipate the future, there is no reason now to believe that any further extension will be required.

Men Injured Fighting Mene Grande Well Fire

The blowout of Mene Grande Oil Company's R G 6, in the Santa Rosa area of eastern Venezuela is becoming more serious, with no progress being made in an effort to bring it under control. The well caught fire shortly after work had been started in trying to shut it in, and is still burning, making sevaral thousand barrels of oil daily along with a considerable amount of gas. Myron M. Kinley, oil fire fighter, flown to the scene, has been badly burned and probably will spend at least 30 days in the hospital. His assistant, William M. McMullen, was also injured and is hospitalized. During the latter part of the week, John R. Jove, Charles A. Hengst, and C. W. Embrey, fire fighters, were rushed by air from the Houston area, and are now working on the well.

Late in the week the well had not cratered, since it was still blowing through the casing head connections, but the master gate has been cut out.

Wants Government Agencies Eliminated Immediately

Immediate elimination of all government war agencies and bureaus was urged in Chester, Pennsylvania, last week by J. Howard Pew, president of Sun Oil Company, as one of three imperatives necessary to insure a great industrial future for the United States.

The first imperative is free markets, controlled only by competition, Pew said in an address. The second, he said, is the prompt establishment by the national government of a sound fiscal policy, "with federal expenditures reduced to a pay-as-we-go basis" and a sharp reduction in taxes. The third is harmonious relations between employers and employes.

Oil Operations Reported Normal in Middle East

New York reports from the Middle East indicate that oil operations in Iran have not been affected by the revolt, which is now confined to the northern and northwestern portion of the country. Since all of the producing, pipe line, refinery, and shipping facilities of Anglo-Iranian Oil Company, principal Iranian operator, are located in the southern portion of the country, the present difficulties are expected to have little affect unless fighting becomes much more widespread. The locale of the unrest is within the Russian sphere of influence and few facts are filtering out.

Meanwhile normal oil operations are expected unless there should be an actual change of government as a result of the present troubles, a remote possibility at this stage.

In adjoining Iraq there has apparently been no lessening of activity since the outbreak of active hostilities in Palestine.

Natural Resources Council Proposed Along With Definite Policy Statement

Creation of a council to make a national inventory of natural resources, encourage development of new reserves and establishing a national policy is provided for in legislation introduced in Congress November 29 by Senator Pat McCarran of Nevada.

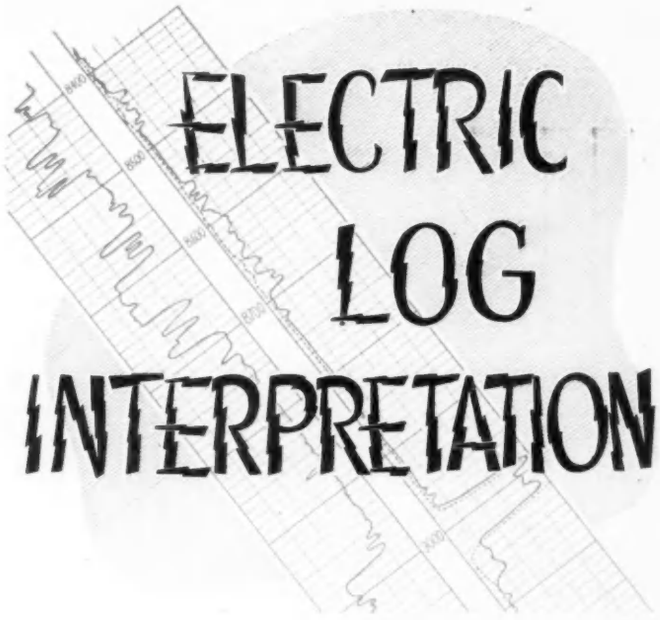
McCarran's measure was introduced shortly after the Senate passed a concurrent resolution, yet to be acted upon by the House, calling upon the Secretary of the Interior to report within six months upon the minerals situation of the United States, including estimates on the current reserves of oil and other minerals.

Similar studies would be made under the bill, but in addition it calls for an "annual accounting" of the depletion of our natural resources and estimates of future natural resources and estimates of future national requirements for critical or strategic materials.

"The proposed council would encourage private enterprise to develop resources and new technologies and protect the rights of individual discoveries of mineral deposits, with government assistance in exploration for new deposits and development of new processes for production and recovery.

McCarran also provides for establishment and maintenance of a stock pile including all critical or strategic materials in amounts sufficient to meet for at least three years anticipated requirements for war production plus essential civilian production.

The first step in the location of petroleum is the discovery of suitable reservoirs. At present, the potential graph of an Electric Log, notwithstanding its shortcomings, is probably the best tool available to the oil industry for locating porous media. The possibilities and limitations of the method are reviewed in in this article.



ELECTRIC LOG INTERPRETATION

Part 1

Location of Sand-Type Reservoirs

By HUBERT GUYOD
Well Logging Consultant, Houston

IN 1944 the oil discovery rate in the United States was slightly less than during the preceding five years and resulted in the abandoning, as dry holes, of over 3500 exploratory wells, a loss of several hundred million dollars to the oil industry.

It is true that the drilling of a certain number of dry holes is an unavoidable consequence of a large exploratory campaign. Nevertheless, one sometimes wonders whether this number could not be somewhat reduced by a better adaptation of our operating practices to modern petroleum technology.

In order to find out which phases of an exploratory campaign are particularly susceptible of improvement, a complete analysis of all causes of failure should be made first. A summary of such an investigation presented in statistical form for the year 1944 could be, for instance, similar to Table 1. This table is very incomplete and it is given here only as an illustration of what might be done. A column is provided in the table for entering the number of abandoned wells for each possible cause of failure. Although exact figures are not available for any of the causes listed, their total should evidently account for all the exploratory wells abandoned in 1944, namely 3519.*

A comprehensive discussion of these failures and of their possible remedies would be of great value towards helping reduce the number of abandoned wells. This, however, is a tremendous task and it is doubtful that it ever will be undertaken. On the other hand, a discussion of certain classes of failures may be offered occasionally.

The present work is a little contribution to the foregoing project. Its purpose is to describe certain errors which are made frequently in the interpretation of electric logs and to present practical data which, it is believed, are of value to those who use these logs for the location of petroleum reservoirs.

* From THE OIL WEEKLY statistics.

TABLE 1
Tentative Classification of Exploratory Wells Abandoned in 1944 (Incomplete)

Reason for Abandoning	Examples		Number
No Pay	No nearby accumulation	No petroleum province	?
	Improper location	Unsatisfactory subsurface date	?
		Improper interpretation of data	?
Pay Present But Not Discovered	No Log	Impossible to get electric log	?
	Improper Log	Use of electric log for locating oil in fractures	?
	Unreliable Log	Electric log in saline mud	?
		Inaccurate well log (cuttings)	?
	Unsatisfactory Log interpretation	Problem not resoluble	?
		Lack of interpretative information	?
Pay Discovered But No Commerical Production	Production impossible	Edge water	?
	Inadequate completion technique	Failure to acidize or shoot tight formation	?
	Technical error	Error in depth	?
		Unsuccessful cement job	?
Miscellaneous	Hole junked	Impossible to recover junk	?
	— — — — — —	— — — — — — — — — — Total	3519

The electrical characteristics of sediments are controlled to a large extent by the nature, amount, and distribution of the fluids which they contain, particularly water. Some knowledge of the size, shape, and distribution of the openings in which fluids can accumulate in rocks is therefore necessary for an efficient use of electrical data.

As far as electric logs are concerned, porous media are classified into three classes, depending upon the geometry of the openings existing between the solid particles. For the sake of convenience, these media are here designated as follows:

clay-type reservoirs,
sand-type reservoirs,
limestone-type reservoirs.

Types of Reservoirs

In this work, the term "reservoir" will refer to any permeable medium capable of accumulating one or several fluids.

Clay-type Reservoirs

These media are characterized by very fine particles providing mostly subcapillary openings. In these formations the fluids obey mainly the laws of capillary. When petroleum is present in such beds, it is found only in small quantities and it is usually extremely difficult to recover it economically with the conventional production methods.

Clays and non-fractured shales belong to this class. In view of the small commercial importance of these formations, they will not be discussed in this work.

Sand-Type Reservoirs

In this type of media, the pore space is characterized by a large number of openings of small size, by a considerable dispersion of the pores, and by a high

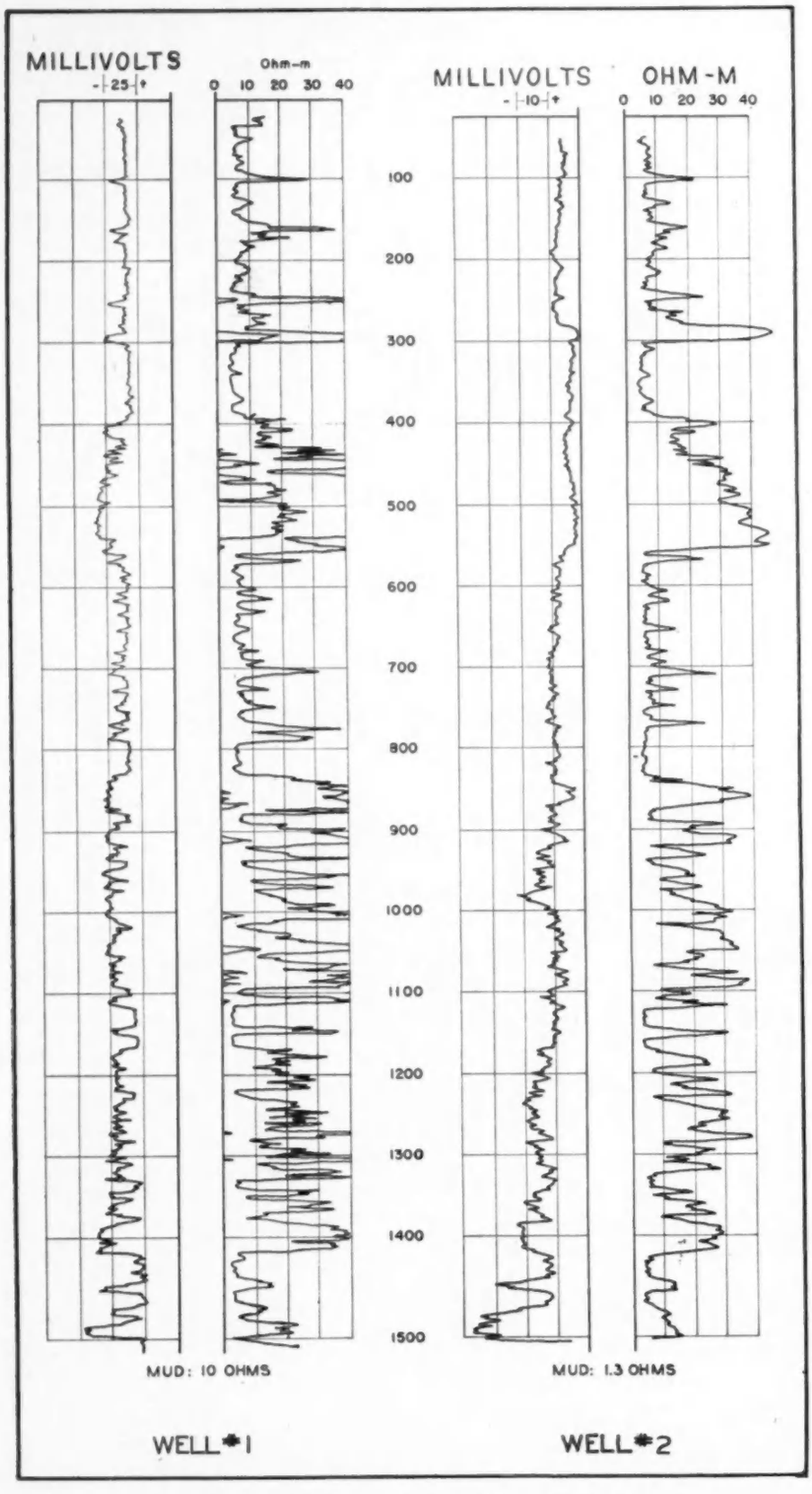


Figure 1. Electric log of adjacent water wells in the Houston area.

degree of interconnection between individual pores. In these reservoirs, the fluids obey the laws of hydrostatics and those of capillarity. Sands and sandstones are typical examples. Porous limestones and porous dolomites which are not fractured and which do not possess appreciable secondary openings belong also to this class. For the sake of simplicity, these media will be called "sands" throughout this work, regardless of their nature.

The laws governing the electrical characteristics of sand-type reservoirs are fairly well known and relatively simple.

Limestone-Type Reservoirs

The openings found in these media are considerably larger than those of sands. For this reason, the interstitial fluids obey chiefly the ordinary laws of hydrostatics. Cavernous and/or fractured limestones and dolomites belong to this group.

The simple methods of electric log interpretation available for sands usually do not apply to limestone-type reservoirs. At present, no really satisfactory interpretative technique is available for this type of media.

All reservoirs belonging to this class will be here called "limestones" for the sake of simplicity.

Locating Reservoirs

The discovery of pay horizons from electric log data comprises the two following steps:

1. Location of suitable reservoirs.
2. Identification of the fluids contained in these reservoirs.

Each of these problems will be discussed separately in this work.

Reservoirs can be located by using two different types of electrical data, namely:

a potential graph,
resistance graphs.

Which type of data should be used depends mostly upon the nature of the reservoirs to be found. For instance, sands usually are located from the potential graph of an electric log, whereas the fractured zones of an otherwise tight lime are better located from resistance data.

Bore Hole Potentials

To better visualize how potential data can be used for the location of reservoirs, a few fundamental facts on the nature of these potentials must be understood.

The electrical potentials observed in bore holes containing ordinary drilling mud seem to be caused mainly by electrochemical reactions taking place between adjacent formations, the water which they contain, and the mud column.[1,2] Although these potentials are quite different from those which would be found if measurements were taken in virgin formations, in particular in the absence of the mud column, it is customary to refer to them as sand potential, lime potential, etc. This will be done also in this discussion.

When the geological column consists of shales and clean sands, the potential of sands is usually more negative than that of shales, provided the interstitial water of the sands is appreciably more saline than the drilling fluid. On the other hand, when certain chemicals are mixed with the mud—sodium silicate, for instance—or when the mud is much more saline than the reservoir waters, the potential of sands is usually less negative than that of shales. The conditions which control the dividing line between these two cases are not exactly known at present. It seems that both the nature and the relative amount of the salts dissolved in the mud on the one hand, and in the interstitial water on the other hand, are the controlling factors. In practice, these data are generally unavailable and the best substitute at hand, namely the electrical resistance of the fluids, is usually considered instead.

The specific resistance of aqueous solutions decreases when the amount of

salts dissolved increases. The rate of decrease, however, varies with the nature of the dissolved salts. Therefore, resistance data on waters usually yield only qualitative data on the total amount of the salts dissolved. In particular, they do not indicate the chemical composition of the minerals in solution. Because of this limitation, resistance data on the fluids involved in bore hole potentials frequently fail to explain the magnitude and polarity of these potentials, especially when the resistance of the mud and that of formation waters are of the same order of magnitude, as in water wells.

At great depths formation waters are, as a rule, considerably less resistant than the drilling mud because they contain a considerable amount of salts in solution. Consequently, the potential of deep sands is usually more negative than that of the associated shales.

Fresh Water Sands

Fresh water sands are characterized by small potential values which may be positive or negative.

In shallow wells, formation waters are generally a little more resistant than the drilling fluid. If the relative resistance of these fluids were the only factor controlling the polarity of bore hole potentials, then fresh water sands should exhibit positive potentials in most cases. In practice, it is found that such a simple rule cannot be applied in many cases. For instance, in the majority of the water wells drilled in or near the city of Houston, sands are more negative than shales, as shown by the log to the left of Figure 1, which is typical of the area. In this well, the resistance of the formation waters averages 15 ohms and the mud resistance was 10 ohms.

A rather uniform potential in all the sands of a shallow section is sometimes though to indicate uniformity in the composition of the fresh water of these sands. Considerable evidence shows that this is not true. Figure 1, for example, represents the electric logs of two water wells located 150 feet apart. One was completed only five days after the other. Correlation between the wells is excellent. The logs show that the electrical resistance of corresponding beds and, therefore, the resistance of their water, is about the same. In other words, it is most likely that the two wells have penetrated identical formations. In well 1—mud resistance, 10 ohms—the potential in sands is reasonably uniform down to 1400 feet, suggesting uniformity in the waters of the whole section. However, water analysis proved that such an assumption is wrong. The potential graph of well 2—mud resistance, 1.3 ohms—shows that many sands are positive while others are negative, pointing also to significant differences in the composition of the water of the sands.

Fresh water sands are characterized not only by small potentials, but also by relatively high resistance values. Limestones having only a small porosity have similar electrical characteristics. It is therefore difficult to distinguish one formation from the other by using only electrical data. However, the doubt can usually be lifted from drilling data, fresh water sands drilling much faster than limes.

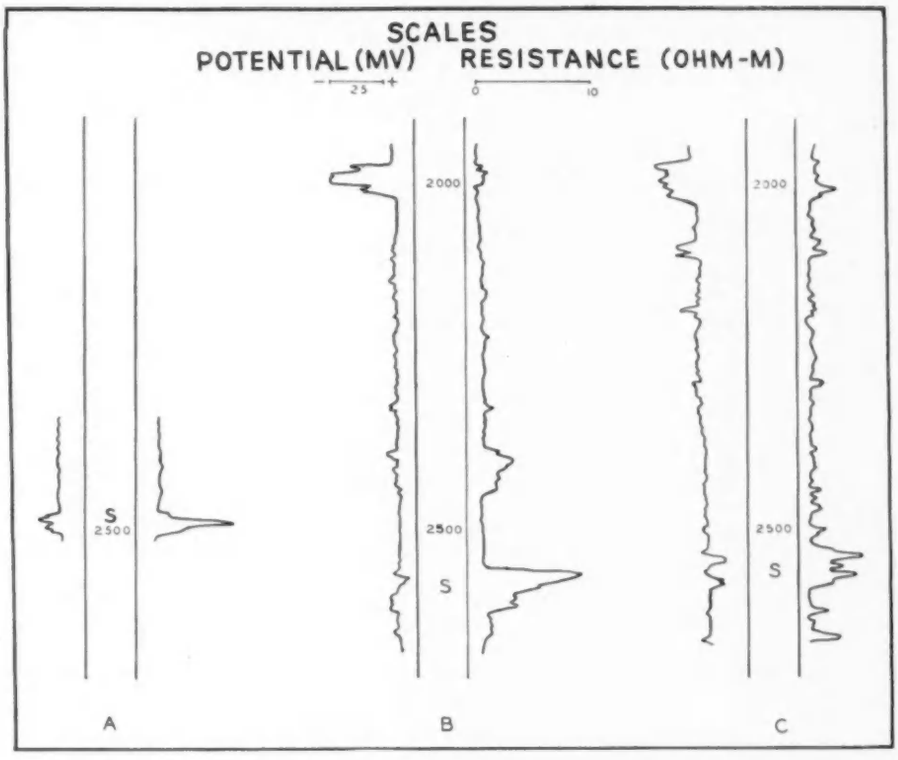


Figure 2. Typical electric logs of the producing section of the Seven Sisters field, Duval County, Texas. (Courtesy The Texas Company)

Salt Water Sands

The potential values found in salt water sands are much more consistent than those of fresh water sands because the relatively large amount of sodium chloride which these formations contain renders the influence of the other salts completely negligible. As a rule the potential is negative and it varies somewhat from well to well, and even from sand to sand of a given well, under the influence of many factors. Some of these variations are not well understood at present due to lack of data. On the other hand, a few have been investigated and will be discussed later.

The potential of thick clean sands usually increases when the relative salinity of interstitial water—with respect that that of mud—increases. Reliable quantitative data on this effect could be obtained only if accurate water analysis for many sands were available. Unfortunately, the data at hand are too scattered and questionable and do not permit a satisfactory analysis of this effect.

Brackish Water Sands

The brackish water sands which frequently are found between the fresh water zone and the salt water zone are usually characterized by negative potentials of small magnitude, perhaps about ¼ the magnitude of the potentials observed in salt water sands. There are some exceptions, however, one of which is illustrated on Figure 2. This plat shows three electric logs of a shallow section of the Seven Sisters field, Duval County, Texas. The sand marked S produces oil in the three wells. Its inter-

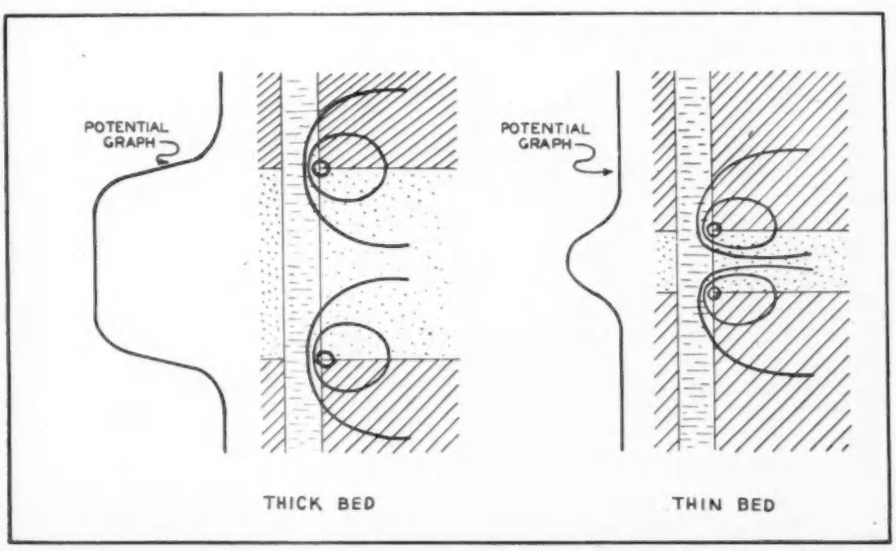


Figure 3. Current pattern in sands of various thickness, showing crowding of current lines in thin bed.

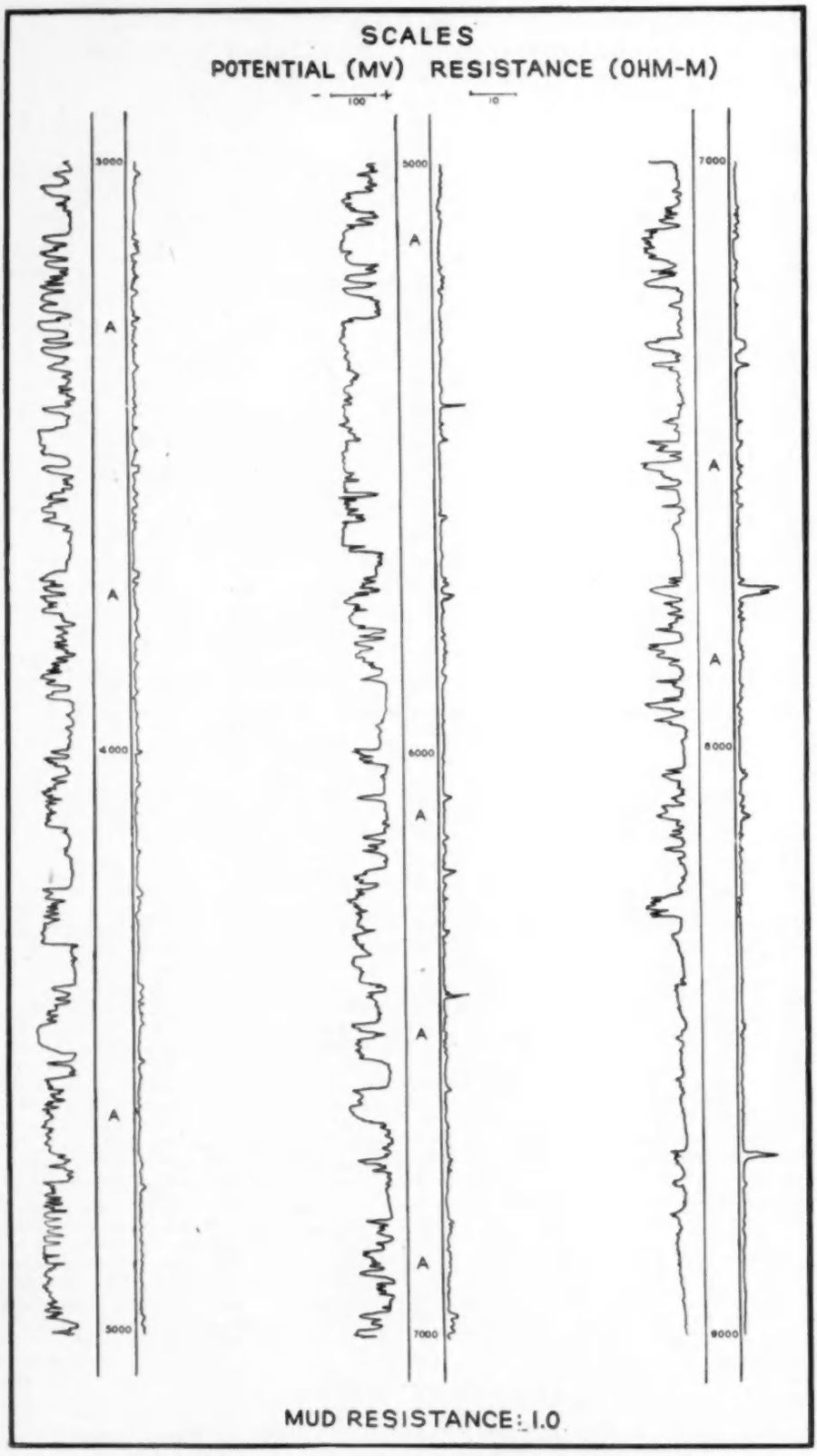


Figure 4. Electric log of the Venice field, Plaquemines Parish, La.
(Courtesy Tide Water Associated Oil Company)

stitial water has a salinity of about 7000 parts per million, corresponding to a resistivity of about 0.6. Although all these wells were drilled with comparable muds of normal salinity . . . resistivity of about 1.2 ohms, corresponding to a salinity about ½ as much as that of the interstitial water . . . well C exhibits a positive potential in sand S, while in well B the same sand is positive at the top and negative at the bottom. Finally, the sand has a normal potential value in well A, i.e., it is slightly negative. All the other sands penetrated by these wells below 1000 feet have a negative potential.

The electric logs shown on Figure 2 are typical examples of the Seven Sisters field. About ½ the logs exhibit a positive potential in sand S.

The foregoing discussion shows that when a fair resistance value is associated with a positive potential, the corresponding section is not necessarily a fresh water sand: it might be an oil sand. It is probable that this condition is extremely rare, but it is well to remember that it is not an impossibility.

It is sometimes believed that positive potentials in oil sands are caused by formation fluids discharging into the bore. This is very likely untrue. Theory does not substantiate such an assumption. Neither does the examination of the logs made in wells showing a tendency to blow out. In the case of the Seven Sisters field where numerous cases of positive potentials are found, no abnormally high pressures have been reported. These freak potentials are therefore most likely caused by peculiar water salinity conditions.

Figure 2 illustrates also the fact mentioned previously that mud resistivity data alone is unable to explain fully the magnitude and polarity of bore hole potentials. The potential divergences found in wells A, B and C probably are caused by the fact that the muds used, although having about the same resistance, had a different composition.

Influence of Sand Thickness

The foregoing discussion has illustrated the difficulty of getting quantitative data on reservoirs from the potential graph. The reason therefor is that the exact influence of a great number of the factors controlling bore hole potentials is unknown. The phenomenon seems so complex that it is doubtful that it will ever be explained fully by theory alone.

Fortunately, there is available a very powerful tool which might allow considerable progress in the understanding of these potentials, namely, the analysis of statistical data. An attempt to investigate quantitatively with this method the influence of bed thickness on the magnitude of the potential will be explained. It has been mentioned[2] that the potential of thin sands is less than that of thick sands, all other factors remaining the same. The decrease is appreciable for beds less than six feet, and it is frequently important to take it into account to arrive at a correct interpretation of an electric log, especially when several sands of a given well have to be compared.

Cause of Decrease

The cause of this decrease is well known (crowding of the current lines in thin sand sections—see Figure 3—resulting in a smaller potential drop in the mud column). This effect cannot be investigated quantitatively by analytical methods, but statistical data yield easily a very satisfactory answer.

For instance, on Figure 4 is shown the electric log of a well of the Venice field, Plaquemines Parish, Louisiana, where numerous sands can be seen. The potential of a great number of these sands has been plotted in terms of the sand thickness on Figure 5. The potential values were measured with reference to the average potential exhibited by the shales situated immediately above and below each sand section used. The sands were selected exclusively from sections where sands are predominant, such as in A, Figure 4. It can be seen that although

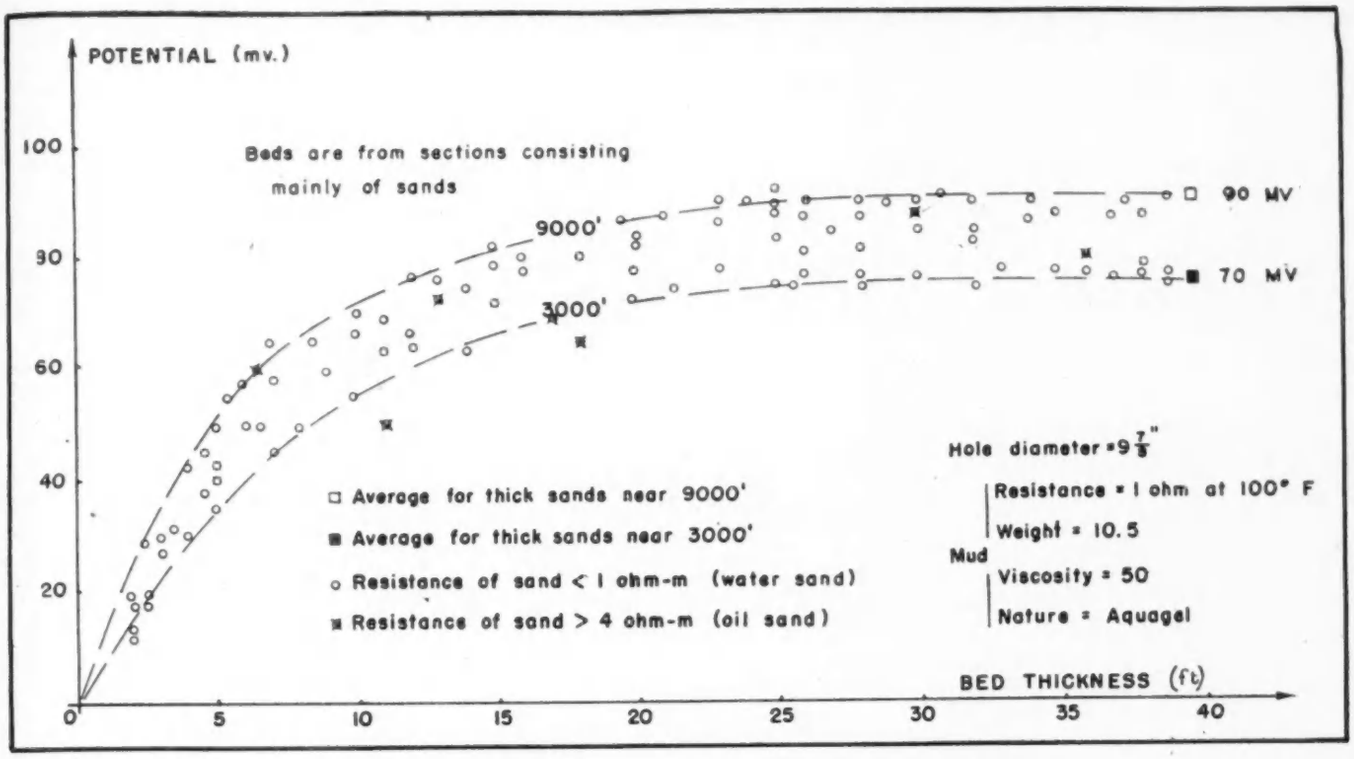


Figure 5. Changes of potential in terms of sand thickness (Venice field, La.)

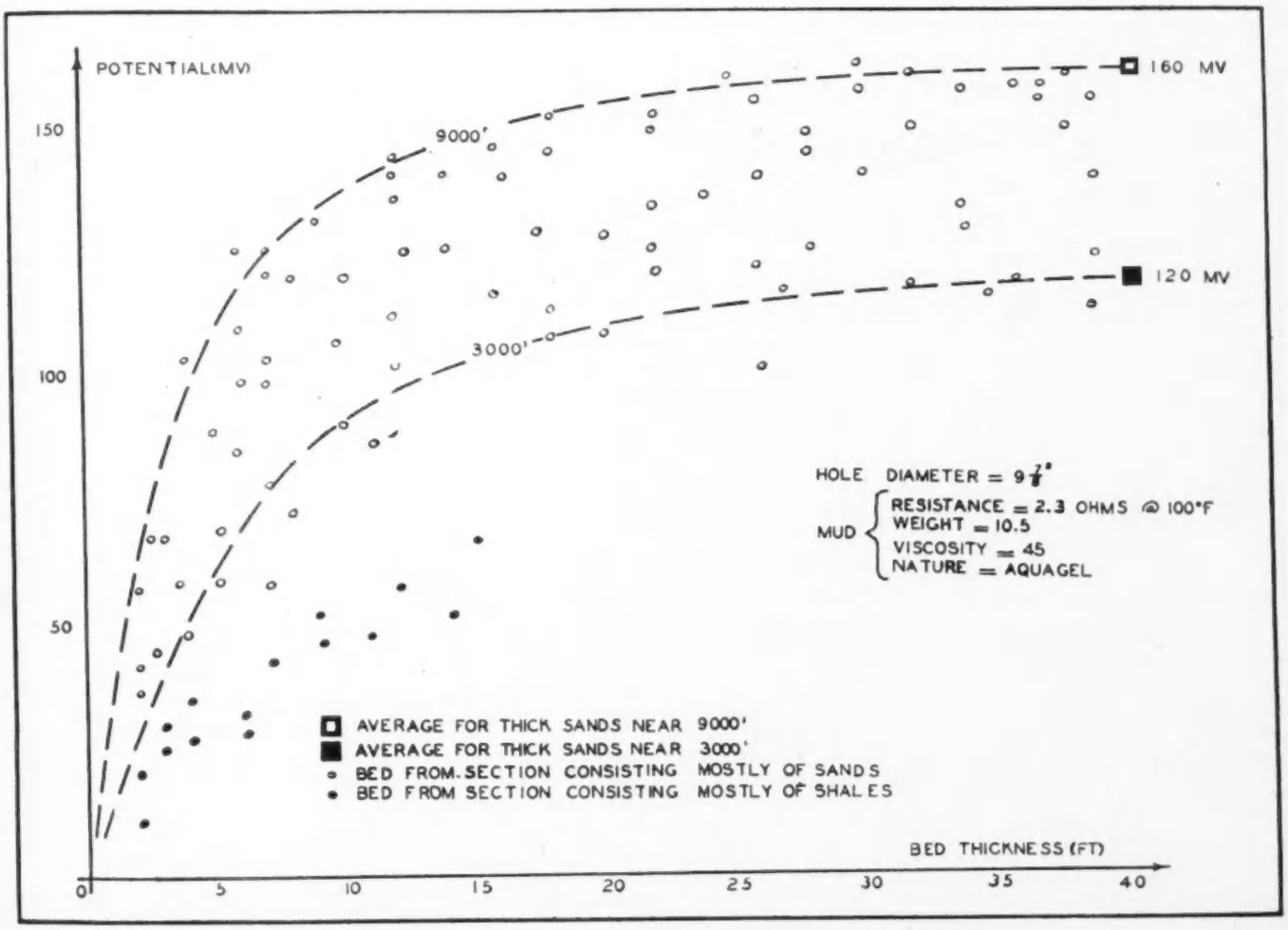


Figure 6. Changes of sand potential in terms of thickness and shale content (Erath field, La.)

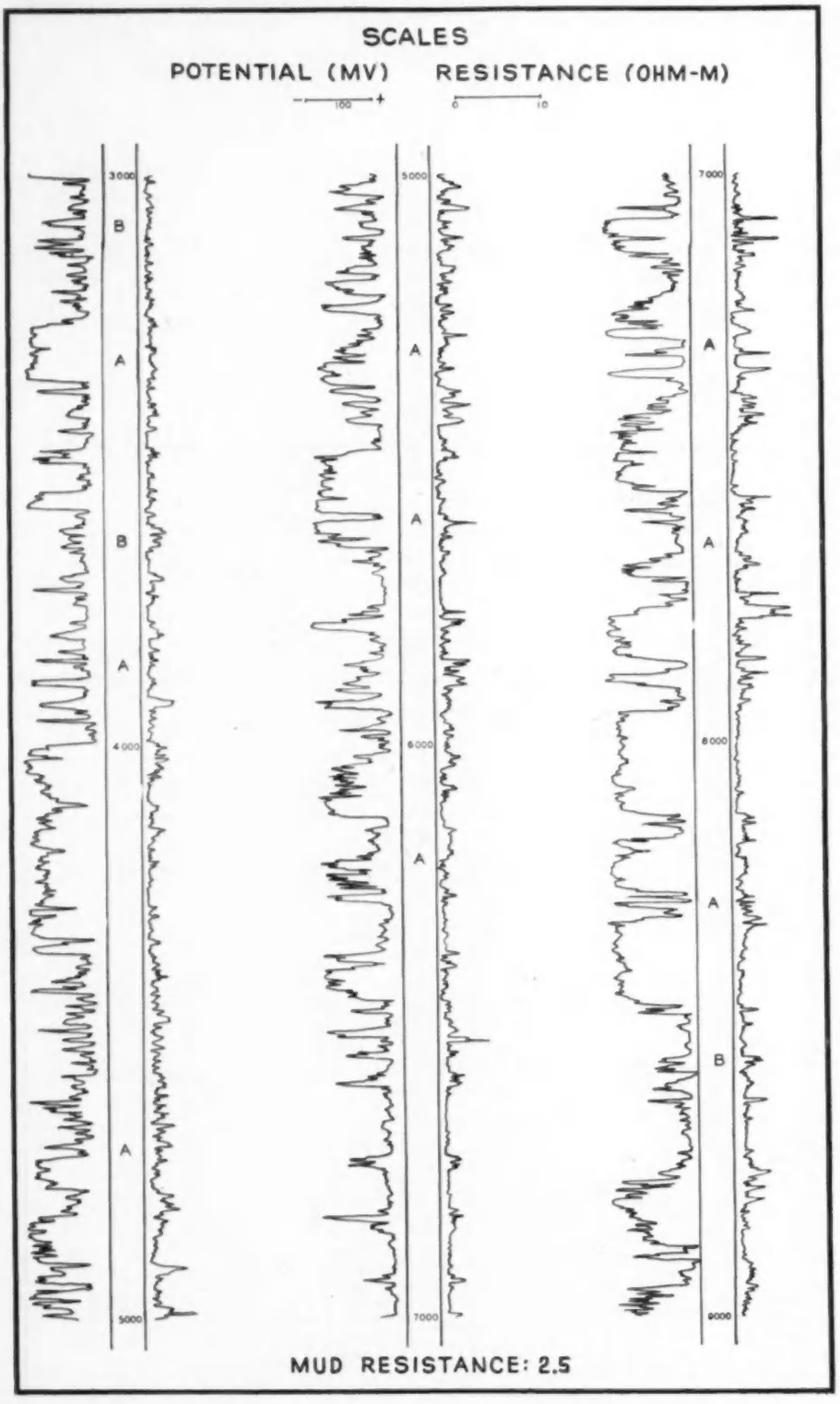


Figure 7. Electric log of a well in the Erath field, Vermilion Parish, La.
(Courtesy The Texas Company)

there is some scattering of the points, this scattering is not great. Furthermore, part of it can be accounted for, for instance that part which is caused by the well known potential changes observed with depth[3]: the greater the depth, the higher the potential of the sands. This depth effect has been indicated on Figure 5 by two dash lines which show the average potential value of the sands situated around 3000 feet and 9000 feet respectively. If a correction were made to take into account this depth effect, the scattering would be considerably reduced, although not entirely suppressed because of the many less important factors (mud invasion, bed resistance, etc.) which contribute to it also.

Figure 5 indicates a significant trend, pointing out to a definite relation between potential and thickness, the potential of thin sands decreasing at a rather fast rate for beds less than ten feet thick.

A similar survey was made for different Gulf Coast fields where the potential of thick sands is reasonably uniform, except for the depth effect. On Figure 6, for example, the white circles represent the result obtained for a well of the Erath field, Vermilion Parish, Louisiana, where the conditions were very similar to those of the Venice well, except for the mud resistance which was 2.5 times greater. The sections used for this survey are marked A on Figure 7. The scattering caused by the depth effect is relatively somewhat greater than for the Venice well. Nevertheless, the same relation between potential and thickness is found again.

It is evident from the foregoing data that, in any problem where the characteristics of sands have to be compared, it is necessary to make a correction to the potential values to take into account the influence of the bed thickness. This will probably be no great surprise to the reader because he is already familiar with the necessity of making similar corrections when the true resistivity of thin beds has to be estimated from the resistance graphs of an electric log.

Correction Factor

The results of an investigation carried out in wells of eight different Gulf Coast fields have been averaged and represented in Figure 8, which gives a correction factor in terms of sand thickness. It is extremely probable that the data are applicable to the logs obtained in any petroleum province.

The use of this correction chart is illustrated in Figure 9. First, the potential of the sand must be determined. This is done by reading the difference between the maximum sand potential at the extreme left, and the average shale potential in the neighborhood of the sand. This difference is 63 mv on the log of Figure 9. Next, the sand thickness has to be estimated. Remembering that each shale-sand contact is situated at the point of inflection on the potential graph, the distance between these points, A and B, gives the sand thickness: six feet.

Referring to the chart, it is found that the correction factor for a six-foot bed is 1.75. Multiplying 63 by 1.75 gives the corrected potential, namely 110 mv. This is the potential which the sand would have if it were very thick.

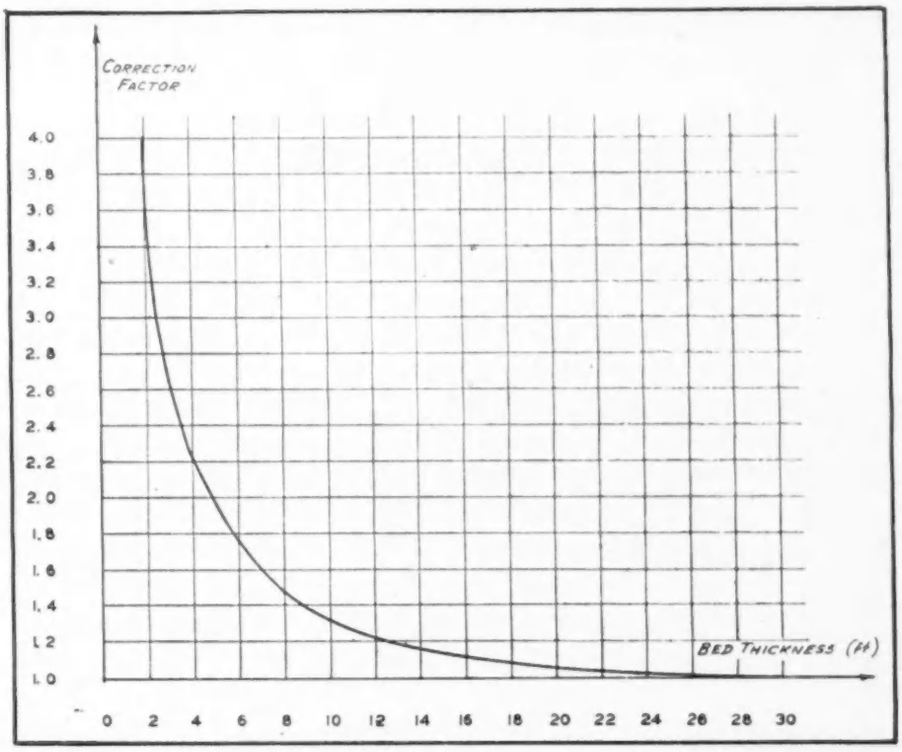
Although the corrected values given by the preceding method are probably not perfectly accurate, they are sufficiently exact to permit ascertaining whether the potential of a thin sand compares favorably with that of neighboring thick sands. Neglecting this correction might lead to condemning groups of thin sands—possibly containing oil or gas—because of their unfavorable response on the potential graph.

Similar Condition

A similar condition exists when thin shale beds are situated in a sand section. Their potential, although less than that of sands, is higher than that of thick shale sections. As a consequence, these shale breaks are frequently mistaken for sand. Such a condition is illustrated in Figure 10.

Every potential depression in a sand section, however, is not necessarily a shale break. It might be caused by lime, local mud invasion in the sand, etc.[2,3] The doubt can usually be lifted by re-

Figure 8. Chart giving correction factor for potential of thin sands.



ferring to the resitance graphs of the electric log. For instance, in Figure 10 it is probable that the potential depressions in the sand section above 7980 feet are shales, while most of those at 7980-8010 are sand (probably invaded by mud).

Distinction of shales from sands is important in valuation work, but is unfortunately frequently made in a rather crude manner.

Figure 8 does not give the correction factor for beds thinner than two feet. No reliable data are available for such very thin beds. It is probable that the potential of sands less than one foot thick is so small that it cannot be seen on the log. An alternation of thin sands and shales can therefore be unnoticed on an electric log, even if it has a good commercial value. Other logging methods, such as caliper logging, might reveal them, however, if the physical condition of the bore is favorable and if the record is properly interpreted.

Shaley Sands

The presence of silt or shale in sands sometimes reduces appreciably the magnitude of the potential observed in these beds. Although no quantitative information is available at present on this effect, some qualitative data are offered in Figure 6. The black circles in this chart represent the potential of a number of sands situated in a formation where shales predominate, such as in section B of Figure 7. It is presumed, from their location, that these sands contain more shales than those represented by the white circles. It will be remembered that these latter sands are in sections where sands predominate, such as A, Figure 7.

A notable reduction of the potential can be observed in the B sands, whether they are thin or relatively thick.

In cases where the shale content is fairly high (perhaps more than 10 percent) the potential value of the sands is still more reduced, and sometimes almost completely suppressed. This is illustrated by Figure 11 which represents a section of the log obtained in a well of the West Mauritz field, Jackson County, Texas. Cores taken at 5380-93 logged a shaley oil sand. The electrical potential of this section is of only a few millivolts and this reservoir might have been overlooked if only electrical data had been available.

Highly Resistant Reservoirs

It has been explained[3] that the electrical potential of reservoirs decreases when their electrical resistance increases. This decrease is extremely small for moderate resistance values. It becomes obvious only in formations which are at least about twenty times more resistant than the associated shales. The potential of oil sands is therefore, on the average, equal or slightly less than that of associated salt water sands. On the other hand, the potential of beds having a high resistance is appreciably reduced. In extremely resistant formations the

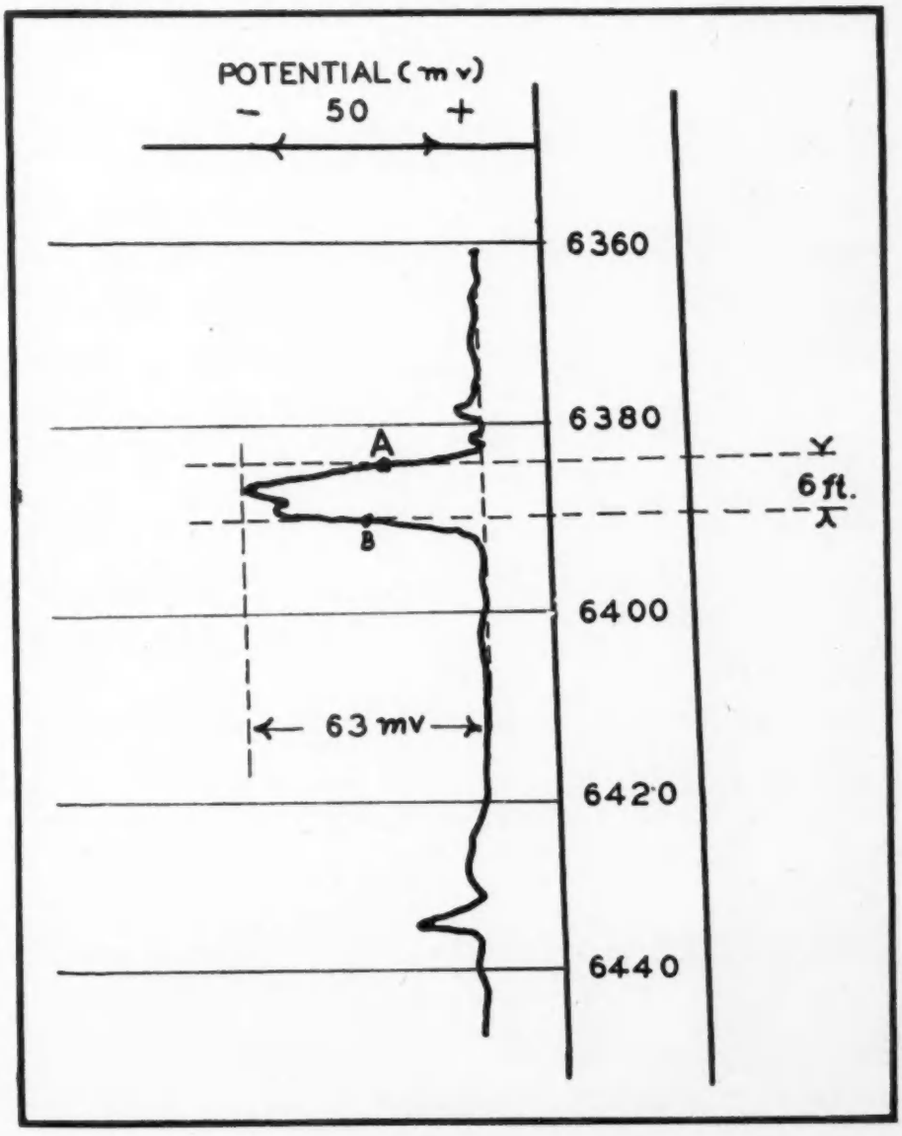
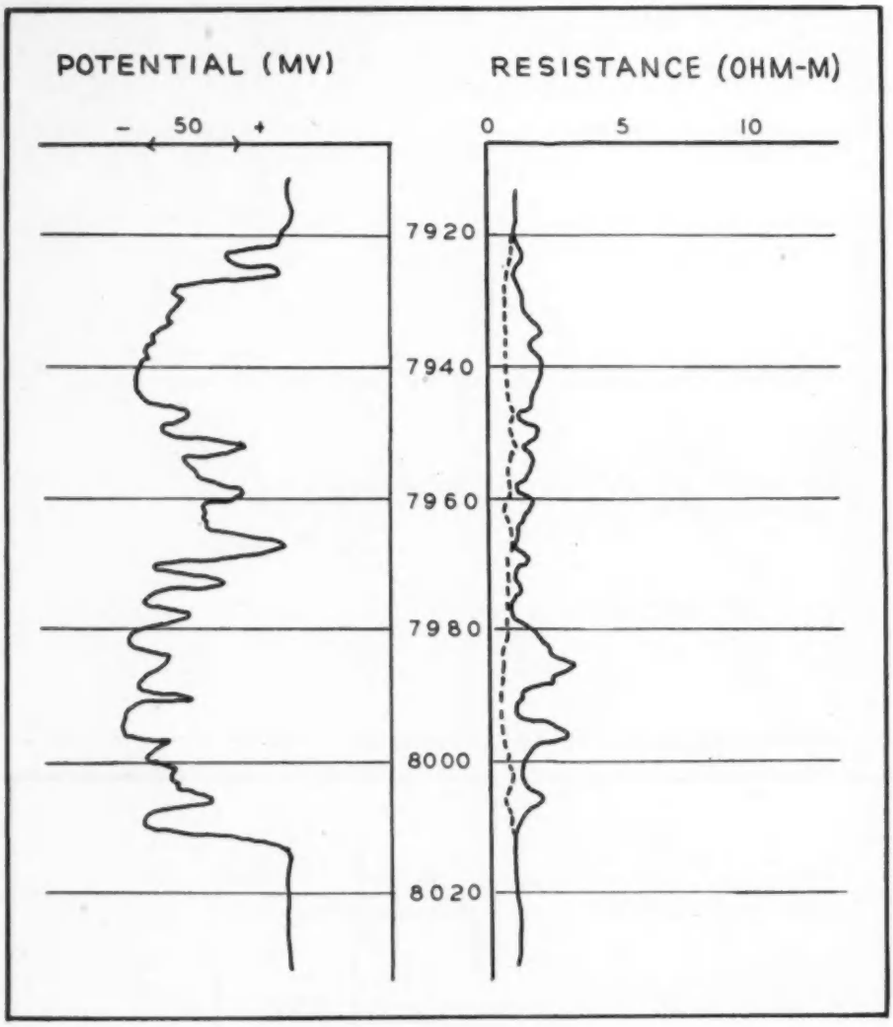


Figure 9. Determination of corrected potential of a thin sand.



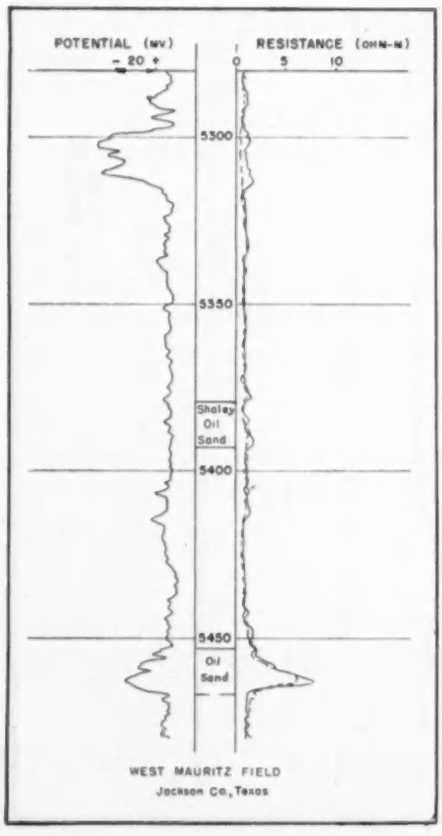


Figure 10 (above). Illustration of potential changes in a sand section due to shale breaks (above 7980 feet) and to mud invasion (below 7980 feet).

Figure 11 (left). Illustration of a very small potential in a shaley oil sand.

potential is always small and sometimes null.

It is known that the electrical resistance of porous formations increases when the effective porosity decreases.[4] By combining this relation with that which has just been mentioned above, it can be seen that the most porous sand-type reservoirs have usually the highest electrical potentials, and conversely, all other factors remaining the same. This property is frequently used in Mid-Continent to obtain rough qualitative data on porosity from an electric log.

This fact should not be interpreted as an indication that a potential graph can be used for securing quantitative porosity data. In fact, at best, only qualitative porosity data can be obtained from a potential curve.

Figure 12 is a typical Oklahoma log illustrating some of the preceding remarks.

Conclusion

We still have much to learn on bore hole potentials. Our present knowledge is so limited that it can be summarized in the following few words: a formation change is usually associated with a potential change, and conversely. There are unfortunately important exceptions, and everybody is familiar with good oil sands whose potential is not significantly different from that of shales.

Although the introduction of the potential graph has contributed much to the location of sand-type reservoirs, it is important to remember that the exclusive use of electrical data to solve this problem might result in important mistakes.

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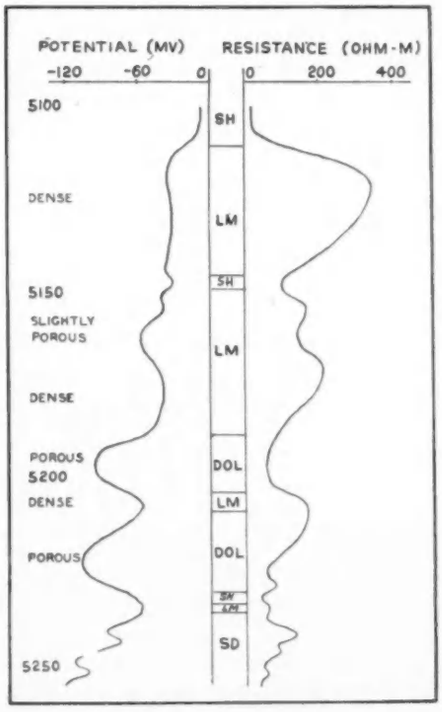
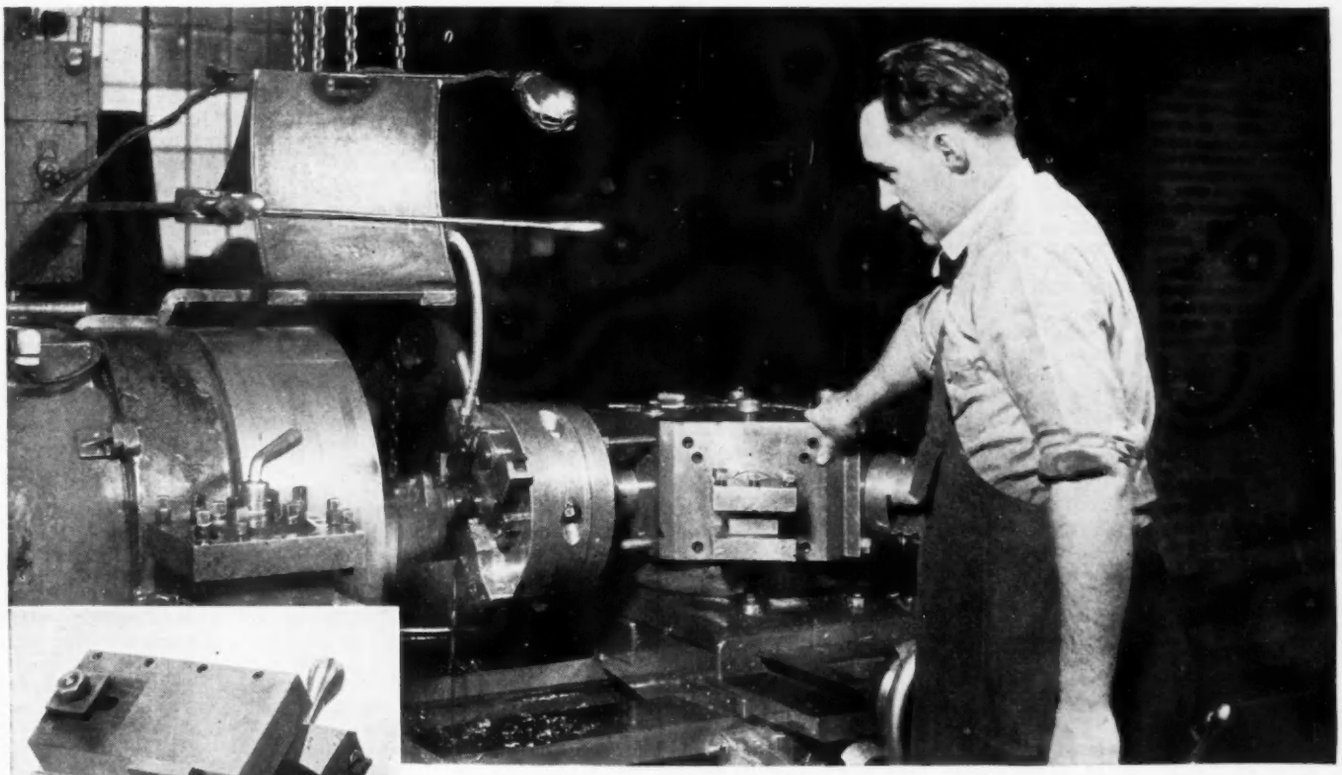
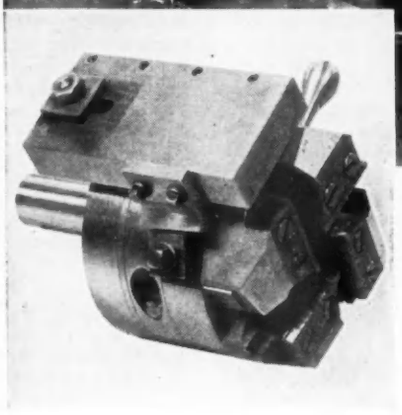


Figure 12. Parallel between potential and porosity in an Oklahoma well.

"The LANDMATIC HEAD Increased Production Over Other Methods Used" . . .





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The Behavior of Water-

By PARKE A. DICKEY
Quaker State Oil Refining Corporation, Bradford, and
KURT H. ANDRESEN
South Penn Oil Company, Bradford, Pa.

THE detrimental effect of accidental plugging of the pores of the sand in input wells always presents a serious problem. In general, three types of materials present in the injected water are apt to cause plugging: (1) suspended solids; (2) dissolved solids; and (3) organic growths. Discussion of the treatment of water to prevent plugging is outside the scope of this paper; therefore the usual causes will only be mentioned here.

Suspended solids include foreign matter and dirt of all kinds. Most common and difficult to remove are iron oxide and hydroxide. Most underground waters contain iron as soluble salts in the ferrous form. On exposure to air they change to the ferric state and, due to hydrolysis, form a fine reddish-brown precipitate of hydrated ferric oxide. This precipitate may be removed by coagulation, settling, and filtration. However, the treated water containing dissolved oxygen is apt to attack the iron pipes and pick up additional amounts of iron oxide on the way to the well. The water may be made inactive by deaeration or treated by other means so as to prevent it from attacking iron.

Other Materials

Other important plugging materials are substances like clay, silt, and other earthy substances that can easily be removed from the water by filtration. The plugging of the sand face by drilling mud and cuttings when cleaning out a well may be important, but there seems to be no way at present of determining the damaging effect of such materials. Thorough swabbing of the well before introducing the water seems a wise precaution.

Dissolved solids include soluble carbonates and other salts which may precipitate on the sand face or in the pores of the sand about the well. When fresh water is used, especially if treated with lime or soda ash, the soluble bicarbonates usually present may be precipitated in the pipe or in the sand as insoluble calcium or magnesium carbonates. When natural brines from a source other than the oil sand are used, reactions are liable to occur between the injected brine and the interstitial water in the sand which may result in the formation of insoluble compounds. Insufficient study has been given to this matter. The presence of barium in one water and sulfate in another, for example, results in the precipitation of barium sulfate. At least one known treating plant has to remove barium from flood water during the treating process.

Certain low forms of plant and animal life, notably bacteria and algae, flourish in tanks and collecting ponds used in the water-injection systems. These forms are often fibrous or gelatinous, so that they are particularly effective as plugging agents.

In general, it has been found that materials fine enough to enter the pores are the most effective plugging agents. Larger materials simply accumulate and pile up on the sand face, and have a minor, although still important, plugging effect.

Using the empirical relationship:

$$r = (8.85)\ (10^{-6})\ \sqrt{\frac{k}{f}} \quad ..(12)$$

Where:

r = calculated radius of the average capillary, centimeters.

The average statistical capillary sizes for certain cores of Bradford sands have been calculated.[8] The calculations indicate that the pore spaces have extremely small diameters, as the following examples show:

Core No.	—	PK-5	H-4
Permeability (millidarcys)	5	128	2.550
Porosity (percent)	14	22.65	10.1
Calculated average pore diameter (centimeters)	0.00106	0.0042	0.028
Calculated average pore diameter (inches)	1/2,400	1/600	1/90

Studies of thin sections of Bradford sands and other evidence indicate that many pores are much larger than indicated by these calculations, and that only the larger pores transmit the oil. Many others, of course, are much smaller than the average, but the values cited give some indication of the minuteness of particles which enter the pores and cause plugging action. Plugging tests were made using the finest particles obtained by elutriating a commercial brand of portland cement. The elutriated particles had an average diameter of 0.004 cm or 1/640 inch; and it was found that they would enter and plug the pores of core H-4, but not those of core PK-5. Likewise, a 2½-percent suspension of ultrafine aquagel in a 1-percent sodium-hydroxide solution would enter and plug the pores of a 24.1-millidarcy Bradford sand, but not one whose permeability was 12.7 millidarcys.

These experiments indicate that foreign particles in input water normally would have to be smaller than those of ordinary portland cement to cause effective plugging of the pores of average sands. They show also that the coarser the sand, the more it is apt to be plugged by moderately sized particles.[9]

It should be emphasized that no well penetrates a single layer of sand whose permeability is equivalent to the average permeability of the sand body. Any normal sand consists of a series of more or less disconnected layers having different porosities, permeabilities, and liquid saturations. There will be a different pressure gradient in each layer, and each layer, therefore, will have a different transient back pressure. On closing the well in, it is to be expected that beds with low transient back pressure will continue to take water for some time. At the surface only the summation of the various back pressures will be noticeable. It is possible that a relatively permeable layer containing no oil, such as a bed originally containing only gas, may show a low transient back pressure even after large quantities of water have been injected. In such cases, which are believed to exist in the Clintonville field, and many others, the wells may show a steep pressure-falloff curve even though the oil pay is being pressured properly. When this occurs, the producing wells have a high water-oil ratio, because of water bypassing through the permeable or water-saturated layers of the sand.

Selective Plugging

The fact that different layers of sand have different transient back pressures has been employed in the deliberate selective plugging of the more permeable beds. The back flow from the tighter beds should prevent the plugging material from entering, whereas the flow into the more open ones should plug them effectively.

Muskat[10] has discussed the theoretical effect of a small zone of material around the well bore, which has a different permeability from the rest of the sand. He shows that, if the permeability of the sand in the immediate neighborhood of the well is appreciably lower than that of the sand body in general, there will be a marked decrease in the production (or injection) capacity of the well. He reports that: "These large effects, caused by small zones about the well bore, are evidently due to the highly localized character of the pressure drop in a radial-flow system about the well center."

Examples of Declining Water-Intake Rates: It has been shown that the intake

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Input Wells

Part 3

Plugging Input Wells

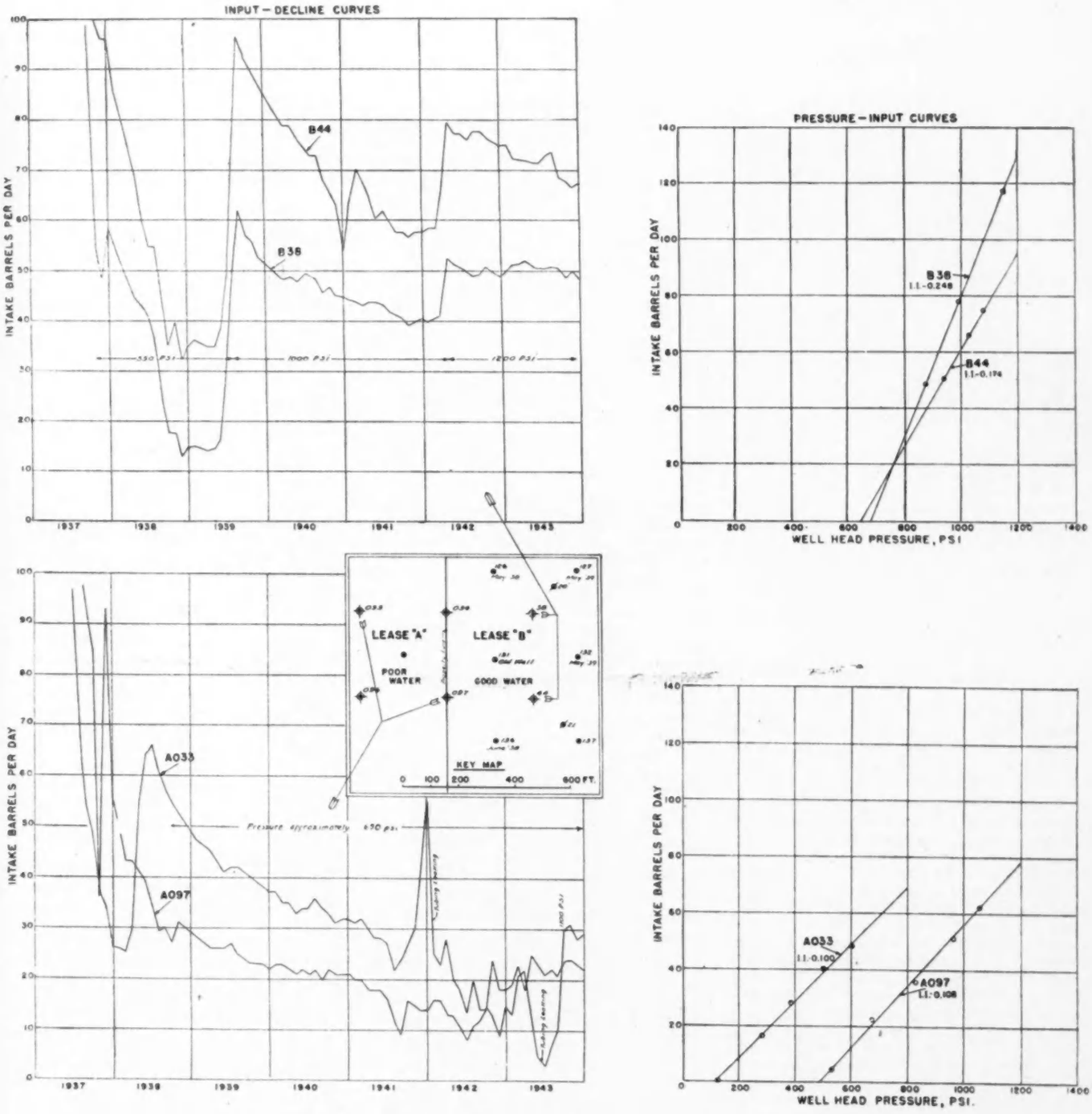
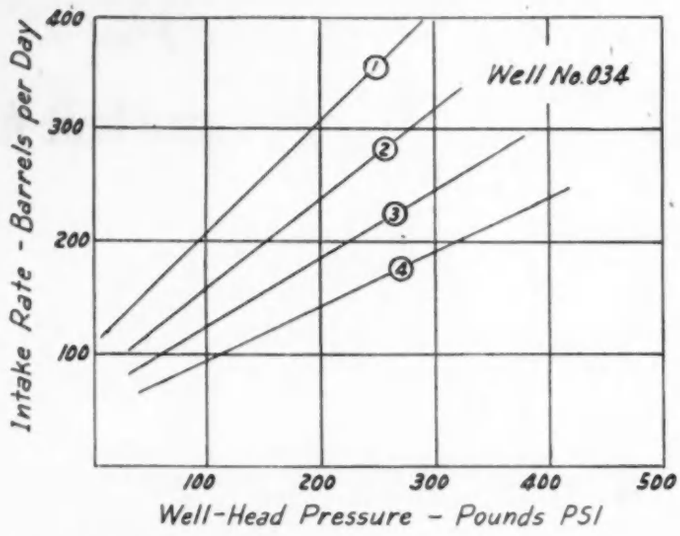


Figure 12. Comparison of input-decline and pressure-input curves of four wells on adjacent leases "A" and "B" (Bradford, Pa.)



Curve 1: Before treatment.
Curve 2: After first treatment.
Curve 3: After second treatment.
Curve 4: After third treatment.

Figure 13. Pressure-input tests of Well 034 (Bradford, Pa.), showing changes in injectivity index after successive plugging treatments with wax emulsion.

rate of a normal well declines during its life, at least until a constant steady-state pressure distribution is established in the part of the reservoir affected by the well. In addition, gradual plugging of the sand face by suspended solids generally takes place. By means of pressure-input curves established at intervals of a few months, it is possible to distinguish between the decrease in intake rate due to plugging from that due to fillup of the reservoir. The former shows as a flattening of the slope of the pressure-input curve (decreasing injectivity index), whereas a decrease in water-intake rate due to fillup shifts the whole curve downward.

Pressure-Input Curves

Pressure-input curves are also helpful in indicating the value of the critical or "breakthrough" pressure, at which rupture of the formation occurs. This phenomenon will be discussed in Part 4.

Figure 12 compares input-decline and pressure-input curves of 4 wells on 2 adjacent leases in the Bradford field. A key map shows the location of the wells tested. Well B-44 was cored, and showed 52 feet of sand of average permeability of 6.3 millidarcys. Of this, 33 feet were over 1 md, and this section had an average permeability of 9.5 md. It will be noted that this permeability is approximately 1/15th of that of well 054 in the Clintonville field. The specific injectivity index at Clintonville averages 0.02 barrels per day per pounds per square inch, whereas in the case of this Bradford well it is 0.0033, or about 1/6th of that at Clintonville. On this basis the Clintonville wells should take 2½ times as much water as they do. The discrepancy might be explained by the fact that the Clintonville sand is softer, and thus probably shatters less during the shot—with a resultant smaller effective well radius.

Lease "B" has had filtered and treated water injected from the start, whereas lease "A" had unfiltered and corrosive water, which has seriously damaged the inside of the water lines. Large quantities of insoluble ferric hydroxide have been forced into the wells, and carbonates have been deposited in the tubing and liner and on the sand face. The intake rates of wells 38 and 44 on lease "B" in 1943 were 50 to 70 barrels per day, respectively; whereas those of the offsetting wells on lease "A" were above 20 barrels per day. Part of the difference in rate is caused by a difference in pressure. However, the pressure-input curves on the right side of Figure 12 show that the injectivity indices of the "B" wells are approximately twice those of the "A" wells. This means that the "B" wells are twice as efficient in injecting water into the sand. The difference can be ascribed mainly to the unsatisfactory water used on lease "A."

Individual well gauges are not available for either lease; therefore, the effect of the low intake rates on oil production cannot be determined. On lease "B" the pressure was increased from 1000 psi to 1200 psi in March of 1942, which increased oil production about 25 percent. The effect of injecting water slowly is to lengthen the time it takes to recover the oil, and the slow rate may well cause a loss of physically recoverable oil.

The use of poor water also affects the cost of production in causing corrosion of surface lines and tubing in the wells. A total of 56 out of 97 intake wells on the "A" lease have had holes develop in the tubing. Not a single string of tubing has had to be repaired on the "B" lease.

Controlled Plugging

Producing Wells: For many years controlled plugging has been applied to oil-producing wells, in order to prevent the entrance of undesirable quantities of gas or water into the well from certain parts of the sand body. The most commonly used method of controlled plugging is known as "squeeze cementing." This measure is a process whereby cement slurry is forced under pressure into the interval of sand from which unwanted water or gas enters the well.

Chemicals have been introduced into the water-bearing sands to form voluminous precipitates on contact with the water and to shut off the entrance of the water into the wells. Such chemicals are antimony trichloride, silicon tetrachloride, ethyl silicate, and others. Another group of chemicals used to selectively plug oil wells reacts with certain ions present in the formation water, forming precipitates which plug the pores of the sand and prevent water from entering the well bore. A third group of chemical plugging agents is a mixture of chemicals in aqueous solution which, after a predetermined time, precipitate and firmly plug the sand. In order to direct the flow of this mixture of chemicals into the desired sand layer, mechanical devices like packers are used.[11]

Plugging with organic plastics that are introduced into the sand as liquid, and that polymerize into solids under the effect of the formation temperature, has recently been successful.[12]

Injection Wells: In recent years much thought has been given to the possibility of selectively plugging specific sand layers penetrated by injection wells in areas where secondary recovery is practiced. Controlled plugging of injection wells should seal off undesirable sand strata, regardless of the irregularity of the well walls. After the oil-production rate in a regular flood pattern has passed its peak, subsequent production is at a relatively low rate—which can be maintained only by maintaining full pressure at the water-intake wells. As a result of the high water-intake pressures, the produced water-oil ratio increases because larger and larger quantities of water pass through highly permeable sand strata which already have been watered out. Finally, the ratio of water to oil produced becomes so large that continued operation often is uneconomical. Consequently, plugging of watered-out strata improves the economy of operation by reducing the quantity of water injected into the intake wells and that pumped with oil from the producing wells and, therefore, lessens the power consumption for pumping, as well as wear on mechanical equipment. Selective plugging also allows increased pressures in the latter life of a flood in order to recover all possible oil from the sands of lower permeability. Increasing the pressure late in the life of a flood is ordinarily not feasible, unless bypassing of water through watered-out sands can be minimized.

The major difficulty in effectively plugging selected sand sections of water-intake wells is that the wells, as a rule, have been shot and have been in operation for some time. As a consequence, the diameter of the well bore varies and vertical-shot cracks exist between the tight strata and the looser watered-out sands. It is thus difficult, and often impossible, to use packers or the like to direct a plugging medium into a specific sand. In the Bradford field, intake wells are generally completed with 1½-inch or 2-inch tubing, with packers set and cemented at the top of the sand, to withstand the operating pressure. Also, it frequently is very difficult to determine exactly into which part of the sand body the water enters because only a small fraction of the wells is cored and, there-

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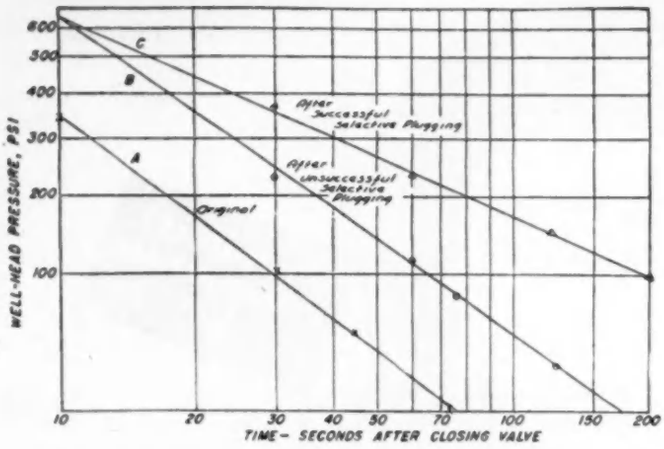

Figure 14. Pressure-falloff curves after plugging with wax distillate and later with chemicals (Bradford, Pa.)

fore, only a few permeability profiles are available. Even when permeability profiles are at hand, the dry permeability profile does not necessarily depict the actual injection profile or give a true picture of the possible variation of intake rates with depth.

Consequently, the "spotting" of the plugging agent is difficult and often impossible, and recourse must be had to a method which uses the variations in flow velocities to carry the plugging medium to the desired section of the wells. Without adequate control, however, "flow-velocity plugging" may cause more harm than good by plugging all parts of the sand and causing a decrease not only in the rate of water intake, but in the oil-production rate as well.

The obvious indication of the success of a controlled plugging operation in watered-out sand strata is the production rates of the oil wells. If the plugging has been truly selective, the oil-production rate will remain constant, or increase; but the water throughput and, consequently, the water-oil ratio will decrease appreciably.

The effectiveness of plugging can be determined also by noting the change in the localized injectivity index, which is directly proportional to the effective permeability and thickness of the sand. If the plugging agent decreases the effective permeability or effective thickness of the sand, or both, the localized injectivity index will be reduced. Thus, a decrease in the injectivity index indicates the extent of plugging, but does not necessarily indicate which strata have been plugged off. This is illustrated in Figure 13, which shows the effect on the localized injectivity index of 3 successive treatments of a well with wax emulsion.

It is suggested that pressure-falloff curves, which show the summation of transient back pressures with time, might show the selectivity of a plugging operation. The decline of back pressure when the well is shut in will be rapid in open sands, and slower in tight ones; and the back pressure recorded at the well head is the resultant of all back pressures of the various individual strata comprising the sand body. When an input well is shut in, the transient back pressure in bypassing strata will decline quickly. The tighter strata will continue to backflow, and flow currents will be set up from the tight into the bypassing strata. If the plugging process was truly selective, and if only the looser sands have been plugged, the general decline in transient back pressure as measured at the well head will be reduced. This is illustrated in Figure 14, which shows pressure-falloff curves on a well in the Bradford pool. The well penetrates a sand 44 feet thick having an average permeability, as estimated from a core from a nearby well, of 15 millidarcys. There is a highly permeable sand having a permeability of 70 millidarcys in the central part of the sand body. It will be noted that curve **A** and curve **B** are virtually parallel. Curve **B** was taken after an apparently unsuccessful attempt had been made to selectively plug the high-permeability sand with wax distillate.

The operating line pressure after plugging with wax distillate was higher than the original pressure, so that the transient back pressures also are higher. However, the rate of change (as indicated by the slope of the curve) did not change. Later, an experimental plugging with chemicals was performed, which apparently was successful, as the decline in the transient back pressure of curve **C** was at a much slower rate than the decline of curves **A** and **B**.

Plugging Materials: A patent was issued to Ryder and Bailey as early as 1927 (U. S. Patent No. 1,661,270) covering the preferential plugging of loose sands by injecting a wax-distillate fraction. The solid wax is carried by an oil fraction against the sand into which most of the injected water escapes. The authors are familiar with several tests that were made in accordance with the patent specifications, but none showed truly selective results.

A patent (U. S. Patent No. 2,264,037) issued to Haskell in 1941 covers the plugging of sands by finely divided solid particles suspended in a carrier medium. The most frequently used suspension of this type is cement or clay in water, although any other kind of suspension or emulsion in any carrier medium could be used. The use of suspension in a carrier medium for selectively plugging water-injection wells has to be controlled carefully, or the result will be harmful and undesirable, as the tight sands as well as loose ones may be plugged.

The means to force the suspended particles into loose sands, and not into the tight ones, finds its origin in the difference in transient back pressure between loose and tight sands. The suspension is forced at full line pressure into the input tubing. When the suspension is opposite the sand, the pressure at the well head is greatly reduced—causing the transient back pressures in the more permeable sands to dissipate rapidly while those in the less permeable sand strata decline slowly. Thus, the back flow from the tight sand, as well as the water pressure from the surface, forces the solids into the most permeable sands.

Most Effective Agents

As previously described, particles of materials approximately the size of the sand pores are the most effective plugging agents. Although certain portland cements and clays contain a large percentage of particles of the proper order of magnitude, most field applications using cement or clay for plugging sands have been failures for the following apparent reasons: The size distribution of the solid particles was too wide; there was too great a difference in the density of the solids and the water; and, possibly, the rigidity of the solid particles caused them to deposit at the entrance of the capillaries without being forced into them. A solid which appears to have more desirable properties than cement or clay for controlled plugging of intake wells, and which can be distributed more evenly and stably in water, is wax. Based upon studies made at The Pennsylvania State College, oil producers in the Bradford field, in collaboration with the Pennsylvania Grade Crude Oil Association, are performing field experiments at the present time using wax emulsions for selectively plugging water-intake wells.

Some operators have used aquagel as a plugging agent. The suspension is forced under pressure into the sand, and that deposited against the tight sands is removed by allowing the well to backflow. Complete information as to the effectiveness of an aquagel suspension is not available, but it is reported to have done some benefit in certain wells. Inasmuch as a thick suspension of aquagel in water will not penetrate ordinary consolidated sands, it appears likely that it will be successful mainly in those wells that have been ruptured by excessive pressure.

Numerous other plugging agents have been suggested and tried in either laboratory or field experiments. Yuster and Calhoun[12] have reviewed, in a recent article, methods of selective plugging with special emphasis on secondary recovery.

(To be continued.)

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Synthetic Rubber In the Oil Industry

By W. M. BALLEW, Southwest Division Manager, Mechanical Division
United States Rubber Company

SYNTHETIC rubber manufacturing will consume large quantities of petroleum products—synthetic rubber products will reduce oil industry costs.

While the public has been well informed on the synthetic rubber program in a general way, most publicity has pointed to the types used in making tires, tubes and civilian consumer goods. Consequently, any article on synthetic rubbers as applied to industry, particularly the *oil industry,* cannot be complete without consideration of all the basic synthetic rubbers and their physical properties.

There are five distinct synthetic rubbers now being produced in commercial quantities. Each is individual in chemical constituents, processing and physical characteristics. Some are a part of the government-owned rubber plant program; others are privately produced and marketed under trade names. Below is a general summary of these basic synthetic rubbers:

Government Designation	Type Name
GR-S	Buna-S
GR-A	Buna-N
GR-M	Neoprene GN
GR-I	Butyl
GR-P	Thiokol

Purposes of Each

All these synthetics can be made into finished products by using the same manufacturing equipment which was used with natural rubber. Buna-S is used as an economical synthetic most closely resembling natural rubber. Buna-N is good for high tensile, oil and aromatic resistance. Neoprene is good for general purposes, requiring high tensile, stretch and resilience, combined with ability to withstand cold, heat, oils, ozone, sunlight and age. Butyl is equal or superior to natural rubber in stretch, electrical properties, aging and is particularly valuable because of its impermeability to water, liquids and gases. Thiokol is resistant to aromatics, oils, solvents, etc., but is used only for particular requirements, because of processing difficulties. A chart accompanying this article shows comparisons of all these synthetics as against natural rubber.

While GR-S or Buna-S government rubber is made in a number of plants to as near an exact uniform product as is possible, the other types are mostly types for particular purposes. Buna-N is produced in several grades by each of a privately produced to the specifications and formulas of that particular manufacturer. Neoprene is made in several number of concerns. Each grade or type is different. The resistance of the different types of Buna-N to the action of gasoline and aromatics is in inverse proportion to their ability to stand low temperatures. We may well expect to see each manufacturer of Buna-N have a specialized line of different types of this raw synthetic, each made for particular uses. One company produced 53 new types of synthetic rubber last year. The compounding and curing of these by rubber manufacturers will determine the qualities of the finished product.

This calls for experience on the part of the rubber manufacturer, not only in compounding but also in knowing the requirements of industry for the finished product. To illustrate, a gasoline hose might be excellent in resistance to gasoline but might fail because it froze stiff in zero weather or sun-cracked in the hot summer. Some compounds shrink when saturated with oils or aromatics. A gasket in an oil line or a packer in an oil well which would shrink would manifestly soon cause leaks and fail in service. Some requirements call for non-swelling characteristics in fluids or gases. Others must have some swell to properly perform.

Now as to the influence of synthetic rubber on the oil industry:

One of the chief constituents of Buna-S, Buna-N and Butyl is butadiene. It is now generally agreed that the petroleum industry provides the most economical source for butadiene. Consequently, vase expenditures will continue to be made to oil concerns for this commodity. It will influence the industry's products for years to come. The value of leases, crude, gas wells and production may well be affected by the amount of butadiene recovery therefrom. Refining processes and engineering will be planned for greater or more economical butadiene production.

some effects that synthetic rubber will have on the petroleum world

In addition to furnishing one of the chief raw materials used in making synthetic rubbers, the oil industry will be one of its largest consumers in the finished, fabricated state. Natural rubber is ruined by constant contact with oils, gasoline or petroleum gases. These volatiles are the natural solvents of natural rubber. The same is true of Buna-S. Consequently, the excellent oil-resisting qualities of Buna-N and Neoprene when properly compounded result in products which last many times as long in service as do the same articles made from natural rubber.

The tube of rotary drilling hose must stand days and months of abrasion by the mud and cuttings. Natural rubber was ideal for this purpose. However, new practices in drilling frequently call for the use of crude oil or mud containing oil. Deep drilling has increased the temperature of the mud which runs through the hose. The combination of heat and oil is ruinous to natural rubber or Buna-S rotary hose lining. High pressure types of hose are used extensively in oil-circulating, well-cleaning systems. Synthetic oil-resisting rotary hose tubes are now performing excellently and may eventually be adapted as standard by manufacturers. Mud pump pistons, gland and swivel packings, valve inserts and gasket materials made of oil-resisting synthetics now make possible drilling procedures which would not have been practical when using natural rubber in this service. Hose of oil-resisting synthetic constructions can now be made for use as flexible connecting lines between gas lines or fuel tanks and the driller's boilers or engines. Formerly only pipe could be used. Hours of valuable labor in rigging up or moving of locations are thus saved.

New Fields Opened

In oil production the oil-resisting synthetics have opened fields formerly not practical for appliances requiring a resilient or stretchable material as a

Comparison Chart—Synthetic Rubber Products

(The data presented cover only generalized types of synthetic rubber. Individual properties may be developed by special compounding, as suggested by the ranges shown in the table. The data are intended to provide the user of mechanical rubber goods with general information about synthetic rubber and should not be used as the basis for making specifications. Definite recommendations as to the exact type of compound for a specific product should be left to the rubber product manufacturer.)

PROCESSING PROPERTIES:	NATURAL RUBBER	BUNA-S (GR-S) TYPE	BUNA-N (GR-A) TYPES	NEOPRENE (GR-M) TYPES	BUTYL (GR-I) TYPE	THIOKOL POLYSULFIDE (GR-P) TYPES
Form in which available	Latex and Solid Forms	Latex and Solid Forms	Latex and Solid Forms	Latex and Solid Forms	Solid Form	Dispersion, Solid & Powder Form
Breakdown	Very Good	Good	Fair	Good-Very Good	None	Slow
Plasticity Range after Breakdown	High-Low	High-Low	High-Medium	High-Low	Medium	High-Low
Building Tack and Cohesion	Excellent	Fair	Fair	Very Good	Good	Fair-Good
Vulcanizability	Very Good	Very Good	Very Good	Very Good	Fair-Good	Fair
General Processability	Very Good	Good	Fair	Good	Fair	Fair
Physical Properties:						
Extensibility	Excellent	Good	Good	Excellent	Excellent	Good
Resilience	Excellent	Good	Fair-Good	Very Good	Low	Good
Tensile	Excellent	Fair-Good	Very Good	Very Good	Good	Fair
Electrical Properties	Excellent	Excellent	Fair-Poor	Fair	Excellent	Fair
Impermeability to Gases	Good	Good	Very Good	Good	Excellent	Excellent
Impermeability to Water	Good-Very Good	Fair-Good	Fair-Good	Fair-Good	Very Good	Very Good
Resistance to:						
Plastic Flow	Excellent	Good	Good	Fair	Fair	Poor
Abrasion	Very Good	Good-Very Good	Excellent	Good	Fair	Poor
Tear	Very Good	Poor-Fair	Fair-Good	Good	Fair-Very Good	Fair-Good
Heat	Fair	Very Good	Excellent	Fair-Good	Fair	Poor
Cold	Very Good	Very Good	Fair-Very Good	Fair-Very Good	Good	Fair-Good
CHEMICAL PROPERTIES						
Resistance to:						
Air	Fair	Good	Good	Excellent	Excellent	Excellent
Ozone	Inadequate	Inadequate	Fair	Excellent	Excellent	Excellent
Light	Fair	Poor	Fair	Excellent	Excellent	Excellent
Petroleum	Poor	Poor	Excellent	Good	Poor	Excellent
Aromatic Oils	Inadequate	Inadequate	Fair-Good	Poor	Inadequate	Excellent

part of their functioning. Polish rod, tubing, and drill pipe wipers now last indefinitely because the rubbers are not ruined by action of oils. Packer rubbers are now made from synthetics which will not swell except from compression. Results are that the same rubber may be used many times. The life of stuffing box rubbers and rings will be materially increased. When the armed forces can release the materials and equipment; rubber companies can furnish flexible hose connections made of oil-resisting synthetics adhered to steel wire braids which will eliminate vibration for pipe line operators at pump stations. These will be particularly desirable when used with the portable type of field gathering pipe line pumps.

Gasket material from specially compounded natural rubber has always given good service in bolted-steel tanks when storing water and crude oil. However, this material was inadequate for storing gasoline, hot oils, etc. The Army and Navy have been able to successfully store thousands of gallons of aviation gasoline in bolted-steel tanks by using a gasoline-resisting synthetic gasket material which was worked out jointly by the engineers of the armed forces, the bolted tank manufacturers and the rubber company chemists. It will be common practice to use bolted-steel tanks for storing gasoline and refined products.

Improved by Synthetics

Gasket materials, molded rubbers and oil-resisting types of hose are greatly improved by using synthetics instead of natural rubber compounds in refineries and gasoline plants. Here expert compounding and knowledge by the rubber manufacturer of ultimate end-use requirements is a *must*. Failure of a gasket may cause fires or accidents. Oil resistance from Buna-N or Neoprene synthetics is easy for the rubber chemist, but to combine oil-resistant qualities with ability to withstand the extremes of intense heat or subzero weather is a difficult task. The acids, chemicals and oils around refineries have always ruined more fire hose than has actual service. A new fire hose recently was announced which has a synthetic rubber cover not injured by acids and oils. It will also remain pliable in cold weather. For many years a gasket known as No. 1771 G.O.P. has been standard for tank-car dome covers and outlet caps. This is a combination of a synthetic compound and natural rubber. It is used as gasket material handling mineral seal oil and gasoline in gasoline plants. Just recently chemists have been able to eliminate the natural rubber and use the new oil-resisting synthetics. There now is a new 1771 which is unaffected by oils or gasolines and has additional desirable features such as abrasion resistance and pliability in cold weather. The life of tank-car gaskets will be multiplied several times.

Adhere to Fabrics

Rubber chemists have now learned how to make the oil-resisting synthetic rubbers adhere to fabrics. Natural rubber adheres readily, but the oil-resisting synthetics do not.

This knowledge is now being applied to thousands of lengths of synthetic rubber oil and gasoline suction or discharge hose in servicing the Navy in the Pacific. This hose will lengthen the service received from dock and loading-rack hose.

The marketing divisions of the oil industry can look forward to improved service from every type of hose. Loading-rack hose which can be lowered into tank-car or tank-wagon domes for bottom loading will not affect or be effected by the gasoline. Filling station pump hose, unhurt by gasoline, will remain pliable winter and summer. Hose has been developed with synthetic rubber covers which can be exposed to the hot sun for indefinite periods without cracking or peeling. Commercial use of propane and butane is expected to increase materially. There has been a decided hazard when handling these voltailes through hose. Safety engineers will be glad to learn of a new flexible hose made of fine steel wire braids combined with oil-resisting synthetic rubber which will not burst at pressures of 2000 pounds and over. Should the hose be punctured, the gas will come out slowly and not injure the workman. The armed forces take practically all of this new synthetic hose today. It will be available to the oil industry soon.

Tank Protection

The handling of caustics and acids mixed with oil prevented the use of rubber-lined tanks before the advent of the new oil-resisting synthetic rubbers and plastics. Rubber chemists have every reason to believe that the improved synthetics which are to come will make this type of metal protection in tanks available to the oil industry.

This article only briefly highlights a few of the effects of the synthetic rubber industry on the oil industry. New forms of these synthetics are being perfected. Oil company engineers are closely following these developments. A word of warning is therefore in order.

In designing new equipment or writing specifications covering synthetic rubbers for oil industry use, do not attempt to specify the type of synthetic to be used. It is better to present the problem to experienced rubber company engineers and chemists who will know the limitations as well as the good qualities of each synthetic. They will know how to compound and vulcanize same without the handicap of meeting just a few requirements set up by the designing engineer. A properly compounded synthetic rubber can do wonders. By the same token, lack of consideration of even one end-use requirement can result in miserable performance.

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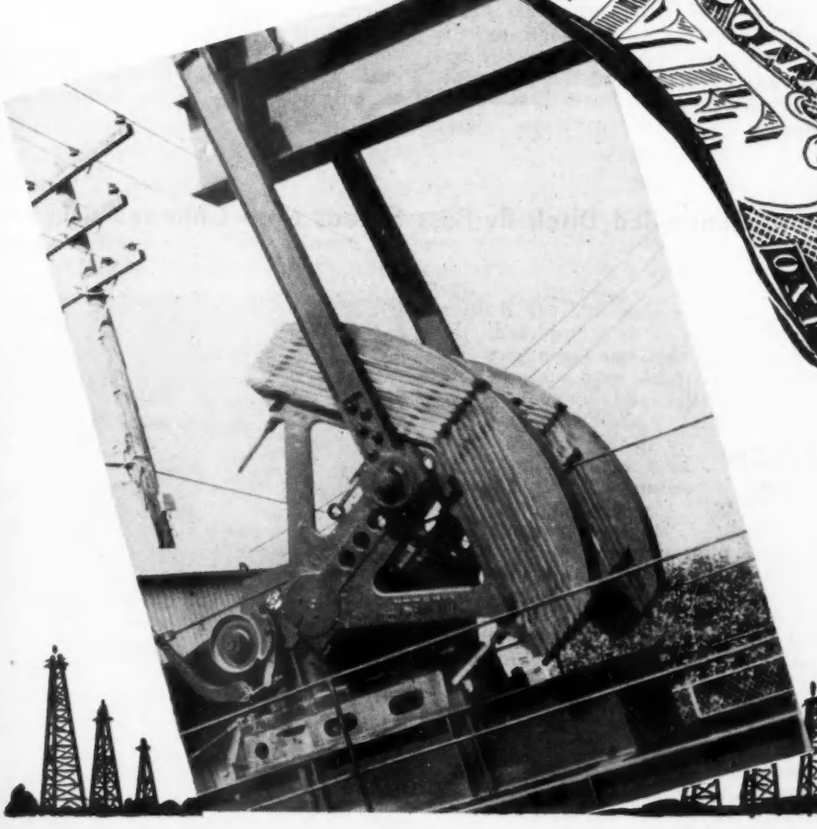


Use Utility Electric Power!

PETROLEUM ELECTRIC POWER ASSOCIATION

Box 1498 Oklahoma City, Oklahoma

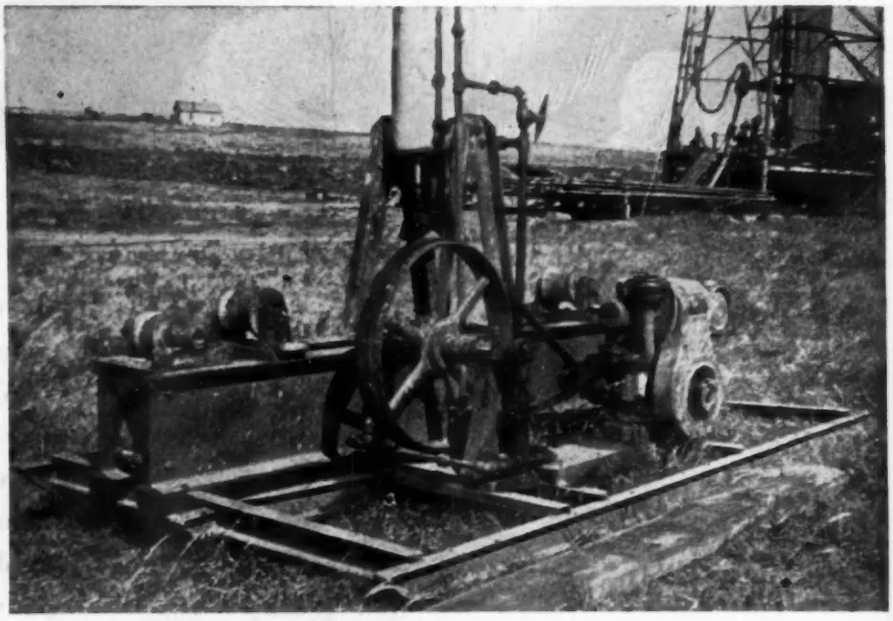
Power Unit and Pump Ease Chore of Straightening Long String of Pipe

Taking the pumping chore out of the pipe-straightening job, and eliminating one man from the crew needed—or leaving one free to rest and relieve his mates at manhandling the pipe—the application of a small power plant to the straightening unit more than pays off in faster work and reduces fatigue for the crew.

DRILL STEM OVERHAUL

The straightener, on its combination skid and base of heavy I-beams, is located on a light welded skid, being set to one side of the frame, so as to permit the mounting of the single-cylinder motor and V-belt driven pump on the same base.

When a string of drill pipe is to be checked and straightened, the crew starts the motor which drives the hydraulic pump unit. The pump is powered through a convention crank-type jack. The hydraulic fluid is allowed to by-pass until a pipe joint is placed in position. Then the by-pass needle valve is gradually closed, bringing the piston of the larger cylinder down as in the hand-operated cycle. As soon as the bend is removed from the pipe, the by-pass is again opened and the piston allowed to return to its normal, clear position.



The unit is compact, easily loaded on a truck, and transported with other equipment on a location shift. It is also rugged enough to stand continuous operation in a reconditioning yard when an entire line of pipe is being worked over.

$5.00 is paid for each illustrated acceptable contribution. Mail to The Editor, THE OIL WEEKLY, P. O. Box 2608, Houston 1, Texas

PENBERTHY
"REFLEX"
WATER GAGE SET

For oil field, locomotive type and marine boilers. Water shows black — steam shows white; the water level is unmistakable. U-Bolt construction is strongest and simplest to service. Glass replaced by simply removing nuts on face of gage . . . unnecessary to work between gage and boiler. Conforms with A.S.M.E., Federal and State requirements when used for pressures specified by their respective codes.

This is one of the complete line of Penberthy gages that meet every liquid level gage requirement.

See Pages 2450 to 2455. Composite Catalog

PENBERTHY INJECTOR CO.
DETROIT MICH. Canad'an Plant WINDSOR, ONTARIO

Remote Controlled Ditch By-Pass Speeds Mud Change

Saving valuable time for the drilling rig after the well is completed, the means adopted by one company for emptying the portable mud sump is both positive in action and inexpensive to build. In one corner of the tank was cut a rectangular opening which is normally closed off by a hinged cover made of heavy steel plate. Faced on the inside edge with rubber composition material, the cover forms an effective seal against a steel lip extending around the outer edge of the opening. The hatch cover is opened and closed by remote control, a handle and lever connected to it on the inside extending over to the opposite, or well side of the tank. Throwing the lever opens the door wide, permitting quick emptying and flushing of the interior. The cover and hinge assembly was recessed into the side of the tank so as to minimize possibility of part of it becoming bent or damaged during loading and hauling. To eliminate soggy conditions in the ground surrounding the rig, a specially made, tapered trough was made up and placed beneath the opening to conduct fluids over to the waste sump. Mud cake around the cover prevents loss during flume flow.

MUD FLOW CONTROL

TRUCKING COSTS GO UP

PROFITS AND PERFORMANCE GO DOWN

When You Install THORNTON 4-REAR-WHEEL DRIVE

HERE IS THE UNIT

which converts a medium 1½ - 2 ton truck into a heavy duty, six wheel truck capable of hauling 8 to 10 tons payload. Delivered complete with 8 new tires. No priorities or WPB release required.

The truck which consistently hauls its loads at the lowest cost is the greatest profit maker. This is the real reason for the big increase in the number of trucks equipped with Thornton Drives. As a typical example:

*A fleet operator selected two standard 1½ ton trucks and equipped one of them with a Thornton Four-Rear-Wheel Drive. He operated both trucks for one year on the same contract. The standard truck could work only 204 days due to bad weather and road conditions. This truck earned a net profit of only 14%.

As compared with this, the Thornton equipped truck worked 251 days, an extra 47 days gained because Thornton's *two* driving axles and 100% greater tractive effort enabled it to operate on soft ground that stopped the standard truck. Also the Thornton unit hauled 100% more payload on each trip. After paying for the equipment and all expenses, the owner had a net profit of 112%.

Today this owner's trucks are all equipped with Thornton Four-Rear-Wheel Drives.

*Name furnished on request.

HERE IS WHAT IT DOES:

- Carries 100% more payload even under toughest conditions.
- Out-pulls, out-lasts, out-maneuvers standard trucks costing double or more.
- Its two-speed gear case provides 100% greater tractive effort or rim-pull.
- Gives better springing. Thornton's walking beam type of spring suspension insures equal load distribution between the two driving axles.
- Six wheel brakes assure greater safety.
- Saves tires . . . gasoline . . . oil . . . wages and time.

GET THE FACTS, AND YOU, TOO, WILL LEARN REAL TRUCKING ECONOMY

The heart of the Thornton Drive is the exclusive Thornton Automatic Locking Differential which gives both axles positive drive and differential action without "Axle Fight".

EVERY

THORNTON 4-Rear-Wheel DRIVE

INCORPORATES A

THORNTON Locking DIFFERENTIAL

ALSO AVAILABLE FOR TRUCK AXLES

Thornton Tandem Co.

8701 Grinnell Avenue, Dept. 76, Detroit 13, Michigan, U.S.A.

Please send me catalog of facts on changing my 1½-2 ton truck into a heavy duty truck.

Name_____

Address_____

City_____ State_____

Make of Truck_____ Year_____

Used for_____

NOW YOU CAN SCRAPE

THE INSIDE OF YOUR

CASING AND HAVE

THE FULL I.D.

CLEAN AND SMOOTH

FREE FROM BURRS

AND HARD CEMENT

By placing the Baker Rotary Casing Scraper above the bit, when you drill out cement, it will remove the sheath of hardened cement, also any scale, and dangerous burrs left from gun perforating. This leaves your casing clean, smooth, and safe so it cannot damage rubbers, packers or swabs, or interfere with future "down-the-hole" operations. No serviceman required. Reasonable rental basis.

Look on Page 357 of the 1944 BAKER, or Composite Catalog, for the BAKER ROTARY CASING SCRAPER

Have you tried Rectorseal Recently?

Improvements developed to meet the severe requirements of the Armed Services has furthered the sealing qualities of RECTORSEAL. These laboratory tested and field proven refinements have been incorporated in the original formula which for seven years has been preventing leaks in threaded, gasketed and coupled connections for the Oil Industry.

If you haven't tried RECTORSEAL recently, get a can today and use it on all connections. Ask for it by name at your supply store.

RECTOR WELL EQUIPMENT COMPANY, Inc.
Ft. Worth, Texas
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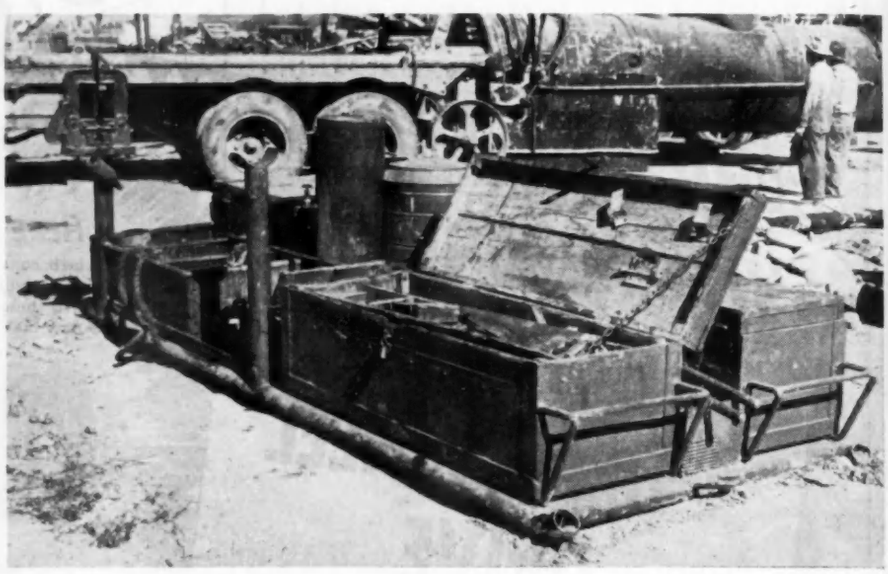
N. Y. C.

RECTORSEAL
THE POSITIVE LEAK PREVENTER

Tool-Box Skid Centralizes and Safeguards Hand Tools



Field work in the rigging-up department of one company is expedited considerably by use of a multi-purpose centralized tool box which is hauled as a single unit and spotted near the expected center of construction activity.

TOOL CARE

The skid-mounted assembly contains three large tool boxes carrying all types of hand tools such as sledges, saws, hammers, wrenches, etc. In addition such other items as drinking water cans, bins for miscellaneous fittings and a pipe vise are carried. Long tools such as shovels, picks and bars are carried in a long bin between two of the boxes.

While the assembly was meant to be carried on the broad carry-all base, individual boxes may be lifted off if needed, special handles being welded to the ends for easy carrying by the workmen. The pipe vise was installed atop a workbench-height post on one corner of the base. A similar post having a yoke pipe rest atop it was installed in line with the vise and several feet away.

Assuring no lag in starting of field work, this skid-mounted tool box assembly is both convenient to carry about and contributes toward keeping track of small tools which ordinarily would become scattered about the area under the system of using individual boxes for each workman.

Slush Pump Valve and Seat Provide By-Pass for Flume

Using only a used valve and seat salvaged from a slush pump, the superintendent of one drilling company has devised an inexpensive mud ditch by-pass valve that is quick-acting and convenient to use. A round hole was cut in the bottom of the mud ditch immediately over the mud reservoir, and the seat was mounted in it. The valve disc, having an extension handle welded to it, was set in the opening. During normal operations the valve is closed, the weight of the disc and its handle being sufficient to keep it in place. Unlike most gates or valves designed for by-passing flow, this simple system is quick and easy to operate and, due to the rugged construction of the mud valve, will maintain a smooth, leak-proof seal for a long time. Shown leaning against the side of the mud trough, the valve has been opened by-passing the mud flow.

FLUME BY-PASS

Special Spacers...

keep your rods free from KINKS and BENDS

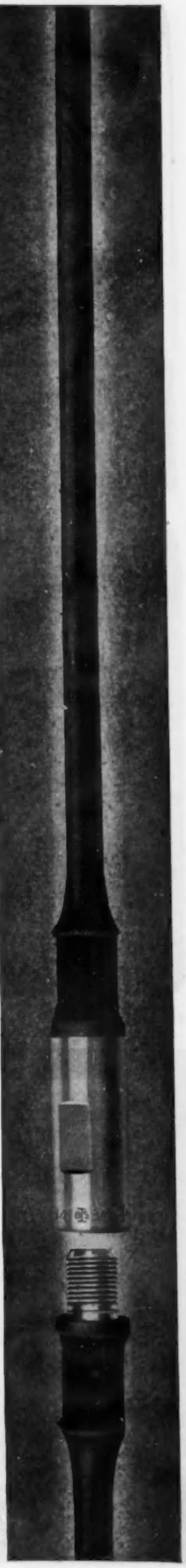
Bent rods? Kinked rods? Not when you order sucker rods from Bethlehem. For Bethlehem racks sucker rods on special wooden spacers which keep rods straight-as-a-die during shipment.

Bethlehem wooden spacers are designed in such a way that each rod bears only its own weight in handling. There's no possible chance for a rod to work loose and come into contact with its neighbor.

Bethlehem wooden spacers are popular for other reasons, too. They are an excellent aid in taking inventory. You can use them indefinitely to rack rods, or carry rods to well locations on your trucks. They eliminate nail-driving and cleat-building, and they space your rods so that rain water drains off completely.

Furthermore, Bethlehem spacers don't cost you a penny. They are supplied free of charge each time you order Bethlehem sucker rods. So why not take advantage of this opportunity to have sucker rods always delivered in A-1 condition? Get your next string of sucker rods from Bethlehem.

★ BETHLEHEM STEEL ★



Bethlehem Sucker Rods

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Most Items in Stock
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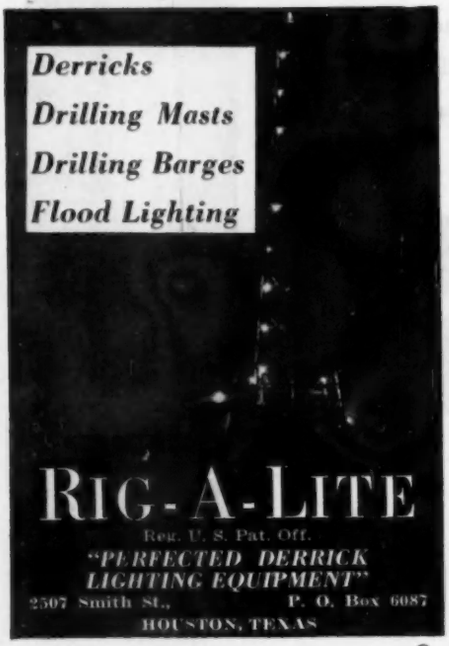
See LAMTEX, Composite Catalog, pages 1570-1571

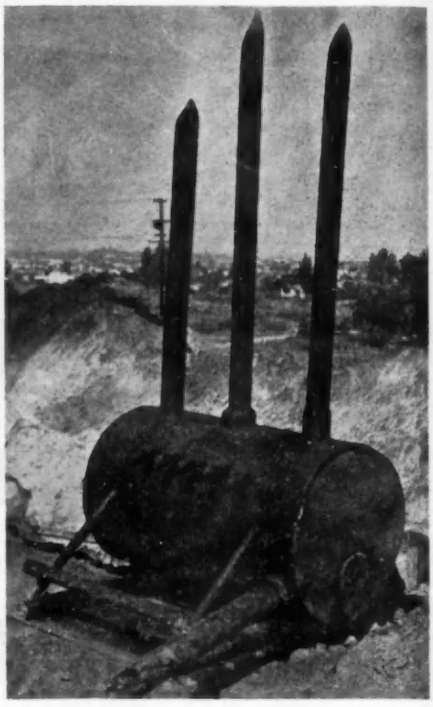


Centralized Fittings Speed Tie-In to Exhaust Muffler

NOISE REDUCER

In densely populated areas where drilling site space is at a premium, great care must be taken so see that all exhaust steam is directed into a muffler so as to reduce noise as much as possible. This usually entails the installing and welding-in of exhaust lines into the one or more mufflers. One contractor, in eliminating much waste time and expensive welder's time at each set-up and tearing down of rig equipment, designed an exhaust manifold which handles the several smaller exhaust lines without necessitating welding.

On one side of the chamber, a section of an old tank, was welded a horizontal row of five 2-inch nipples to which were attached 45-degree elbows. Normally closed off with an ordinary pipe plug when not in use, these fittings may be used for attaching practically any small auxiliary steam exhaust line that might be used around the rig. No welding is required to install line connections, nor is a cutting torch required to remove the lines, as is the usual practice on many such installations. The small initial cost of installing the permanent fittings is more than offset by the savings realized.

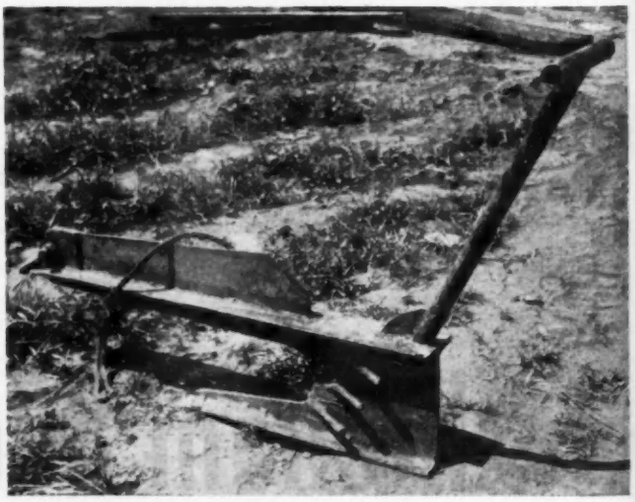


Improvised Plow Breaks Hardpan or Field Road Paving

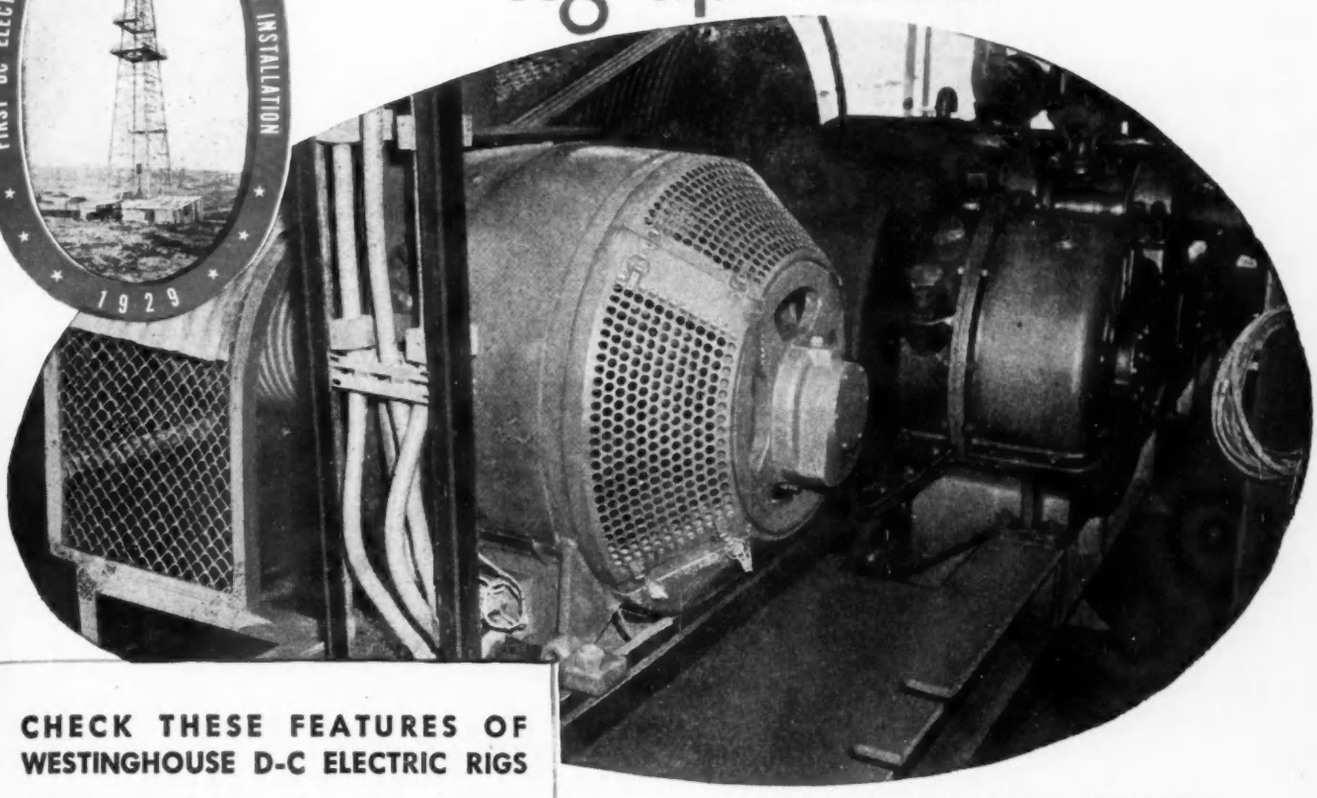
DITCHING EQUIPMENT

Various and ingenious types of shop-made road plows have been devised by oil company rig-building and pipe line crews for the purpose of breaking up difficult hardpan and old paving surfaces when installing drilling equipment or pipe lines. The type illustrated, made from a short piece of heavy I-beam, cut out and strengthened at critical points, has been used with considerable success by some operators, but in at least one respect, this particular type represents a definite improvement over the older types. Just to the rear of the opening cut out of the channel or center portion of the plow, are welded a number of short stubs of sucker rod material. The stubs of rod, three on each side of the unit, are welded so as to cause the projections to rake back at an angle, serving to throw back the heavy earth or paving material as it is broken loose by the cutting tooth.

Operation of the plow is simple and convenient for construction crews. A field truck is hooked on to a clevis bolted to the front of the unit, and as it moves along digging into the ground, a man walks behind holding the plow erect by means of the pipe handle. The sucker rod stubs greatly aid in the cracking and throwing back of material, increasing the overall efficiency of the unit.



rig-up faster— — —



WITH WESTINGHOUSE ELECTRIC DRILLING RIGS

Easier Installation—that's what you can expect with Westinghouse electric drilling rigs.

Almost as soon as they arrive on location, they're ready to go.

That's because they're skid-mounted... in small, easy-to-handle units. Then, too—you won't have any steam pipe or complicated mechanical connections to make. Flexible cables carry the power—*wherever you want it most.* Just connect the cables—then spud in.

All control and meter circuits between the derrick floor and the main control cabinets use factory-built, foolproof, multiconductor plug-and-receptacle wiring. There's no chance for incorrect wiring in the field—it has been tested before it leaves the factory.

This simplified hookup is the result of years of *actual rig and field experience.* Westinghouse built the first diesel-electric drilling rig—*in 1929.* Since then we've built more than forty d-c rigs, and have had experience on every type —from the simple single-generator, semi-electric rig to the modern multiple-generator full-electric rigs.

Whether you use rotary rigs for deep or shallow wells—wildcat or proved lease drilling, Westinghouse can help *you* with your drilling problems. For complete information, call your nearest Westinghouse representative, or write for Booklet 3038. Westinghouse Electric Corporation, P. O. Box 868, Pittsburgh 30, Pa. J-94677

CHECK THESE FEATURES OF WESTINGHOUSE D-C ELECTRIC RIGS

MOBILITY — Westinghouse rigs will go anywhere. They're skid-mounted for trucking in on isolated locations, or for permanent installation on barges or trailers. Units are light—easy to handle.

FLEXIBILITY — When the power is transmitted through electric cables, you can locate your power plant and slush pits, relative to the derrick floor, to meet any condition—no time lost in adapting rig to a new location.

EASE OF INSTALLATION — Electric drilling rigs are ready to go, almost as soon as they're hauled in on the lease—connect flexible power cables, and plug in foolproof control circuits.

SMOOTHNESS OF OPERATION — Electric control gives smooth, fast load pickup—with no engine stalling. Full power for hoisting—or drilling—is instantly available through pushbutton control at the draw-works.

ECONOMY — Drilling costs you less per foot of hole with Westinghouse electric rigs—you save setup and drilling time. You'll save on maintenance costs, too, with reliable, economical drive.

EXPERIENCE — Since 1929 Westinghouse has built over 40 d-c electric rigs—and has had actual rig and field experience on every type—cable tool or rotary, deep or shallow drilling, a-c or d-c power.

Westinghouse

PLANTS IN 25 CITIES . . . OFFICES EVERYWHERE

ELECTRICAL EQUIPMENT FOR THE PETROLEUM INDUSTRY

Distillate Fuel Oil Stocks Reduced; Gasoline and Residual Accumulate

Crude oil production in the United States was reduced slightly and refinery runs were lowered a little in the week ended November 24, reports to the American Petroleum Institute showed. Gasoline continued to accumulate in storage in substantial volume, and there was a large rise in stocks of residual fuel oil, but some distillate fuel oil came from storage.

U. S. crude output averaged 4,469,000 barrels daily, down 5000 from the previous week and 265,000 a day or 5.6 percent less than production in the comparable week last year. Crude runs to stills at 4,648,000 barrels daily were off 45,000 from the week before and 58,000 a day or 1.2 percent less than in the corresponding week a year ago. Crude oil stocks totaled 220,503,000 barrels on November 17, the Bureau of Mines reported, having increased 504,000 within the week. They were then about the same as the year previously.

Gasoline production totaled 15,681,000 barrels during the November 24 week, up 104,000 from the week before and 916,000 barrels or 6.2 percent more than output in the like week last year. Stocks of finished and unfinished gasoline rose 2,230,000 barrels during the week to 83,184,000 barrels, and that amount was 3,473,000 barrels or 4.3 percent more than the 79,711,000 barrels held November 25 last year. Civilian grade stocks of 57,536,000 barrels compared with 40,870,000 held a year previously, and military and other stocks of 25,648,000 barrels compared with 38,841,000 a year ago.

Distillate fuel oil production of 4,802,000 barrels was 216,000 more than the previous week and 311,000 barrels or 7 percent more than in the like week last year. Stocks of distillate decreased 83,000 barrels and then totaled 45,258,000 barrels, or 1,255,000 barrels (2.7 percent) less than the 46,513,000 barrels held November 25, 1944.

Residual fuel oil production amounted to 8,800,000 barrels in the week ended November 24, an increase of 286,000 barrels over the previous week, although 400,000 barrels of 4.3 percent less than output in the corresponding week last year. Stocks of residual increased 1,866,000 barrels to 47,474,000, but that amount was 15,573,000 barrels or 24.6 percent less than the 63,047,000 barrels held a year ago.

Trends of Operations and Changes in Stocks

Figures on crude stocks are from Bureau of Mines weekly reports; all others from American Petroleum Institute weekly reports, which are estimates on Bureau of Mines basis.

(All figures in thousands of barrels—add 000)

HIGHS AND LOWS OF RECENT YEARS

ITEM	Crude Oil Prod.		Runs to Stills		Crude Stocks		Gasoline Stocks		Gasoil and Distillate Stocks		Residual Fuel Oil Stocks	
	Barrels Daily	Week Ended	Barrels Daily	Week Ended	Barrels	Week Ended	Barrels	Week Ended	Barrels	Week Ended	Barrels	Week Ended
Highs:												
1941	4,337	11-22	4,120	10-18	266,187	3-29	99,727	3-29	[1]54,983	11-15	102,448	1- 4
1942	4,337	2- 7	3,961	1- 3	263,208	3-28	[1]109,281	3-14	47,861	11-14	95,857	1- 8
1943	5,436	11-13	4,331	12- 4	245,752	5-29	94,159	3-20	47,187	11-27	72,881	1- 2
1944	4,762	9-30	4,798	12-30	240,992	1- 1	89,162	4- 1	48,162	10-28	64,744	10- 7
1945	[1]4,944	7-14	[1]5,140	8-18	227,554	10-13	99,012	3-24	45,341	11-17	56,074	1- 6
Lows:												
1939	[2]1,601	8-26	3,125	2-18	[2]229,127	10-12	71,152	10- 7	20,722	4-15	105,397	4- 3
1941	3,364	1-11	3,490	1-18	240,399	11-15	79,923	10- 4	28,382	4-12	90,914	7-13
1942	3,297	7- 4	3,393	5-23	231,896	12-12	75,934	12- 5	29,240	4-25	72,962	12-26
1943	3,821	1- 9	3,579	3-18	232,191	1- 9	68,182	10-16	30,732	4- 3	57,596	12-25
1944	4,357	1- 1	4,228	[3]2-12	220,258	9- 9	76,302	1- 1	30,232	4-19	49,737	3-18
1945	3,621	10- 6	3,409	10- 6	211,813	8-25	70,791	10-13	26,483	3-17	38,548	5-26

TRENDS OF 1944 AND 1945

Trends in Week Ended:	Crude Oil			Gasoline		Gasoil and Distillate		Residual Fuel	
	Production Daily	Runs to Stills Daily	Stocks Week End	Production Weekly	Stocks Week End	Production Weekly	Stocks Week End	Production Weekly	Stocks Week End
1944:									
January 1	4,357	4,453	240,992	13,192	76,302	4,575	42,310	9,141	57,380
January 29	4,400	4,359	240,251	13,427	81,075	4,054	37,266	8,889	52,857
February 26	4,423	4,377	237,137	13,183	85,248	4,558	33,766	8,952	51,387
March 25	4,385	4,443	236,285	13,362	87,287	4,979	31,319	9,018	51,669
April 1	4,383	4,435	234,667	13,824	89,162	4,450	30,530	8,367	51,326
April 29	4,431	4,300	235,342	13,126	88,342	4,284	30,236	8,398	49,985
May 27	4,514	4,532	234,423	13,502	86,468	4,702	32,035	8,568	49,812
July 1	4,587	4,638	228,860	14,052	83,559	4,496	35,360	8,872	52,235
July 29	4,608	4,627	225,112	14,115	82,665	4,833	38,135	8,900	56,280
August 26	4,667	4,698	222,931	14,112	80,740	4,566	41,453	8,680	59,839
September 30	4,762	4,775	222,393	14,494	78,028	4,622	45,329	9,292	64,226
October 28	4,740	4,658	223,235	14,117	79,058	4,772	48,705	8,985	64,382
December 2	4,712	4,693	221,591	14,853	80,427	4,082	45,832	8,981	61,727
December 9	4,704	4,552	220,258	14,611	80,880	4,056	44,430	8,923	60,458
December 16	4,695	4,537	222,075	14,145	82,747	4,353	42,413	8,727	59,280
December 23	4,729	4,682	222,575	14,635	83,355	4,605	40,846	8,798	58,509
December 30	4,705	4,798	222,998	15,342	86,614	4,257	39,495	9,156	57,430
1945:									
January 27	4,727	4,756	221,310	14,957	88,223	4,843	33,561	9,252	51,119
February 24	4,777	4,803	219,351	15,500	95,972	4,958	28,753	9,084	46,713
March 31	4,781	4,677	223,782	14,644	98,758	4,548	26,889	9,184	41,745
April 28	4,805	4,780	223,474	14,633	94,068	4,636	28,273	9,379	39,813
May 26	4,887	4,950	222,831	15,194	89,121	4,667	29,184	9,670	38,548
June 2	4,859	4,804	224,079	15,317	88,696	4,857	29,819	9,437	39,022
June 9	4,853	4,827	221,552	15,256	87,896	4,842	30,339	9,382	38,996
June 16	4,888	4,915	221,932	15,132	87,504	5,342	30,397	9,252	39,482
June 23	4,898	5,002	220,974	15,367	87,462	5,014	31,761	9,558	39,893
June 30	4,903	4,999	220,781	15,546	86,472	4,910	32,213	9,077	40,488
July 7	4,886	5,006	217,250	15,082	86,329	4,875	33,667	9,238	40,754
July 14	4,944	4,945	216,355	15,349	85,401	5,197	34,804	9,337	41,489
July 21	4,944	4,927	218,108	15,430	85,930	5,090	35,458	9,071	42,480
July 28	4,930	4,996	218,507	16,106	86,008	4,598	36,071	9,586	42,283
August 25	4,892	4,931	[4]211,813	15,986	84,693	4,960	39,782	9,356	46,201
September 29	4,357	3,812	222,387	11,913	79,552	3,940	43,689	7,047	46,853
October 27	4,273	4,838	224,230	15,530	74,335	5,159	43,472	8,891	45,943
November 3	4,818	4,807	221,031	15,234	76,551	4,986	44,810	8,922	46,128
November 10	4,451	4,789	219,999	15,793	78,188	4,851	45,126	8,887	45,936
November 17	4,474	4,693	220,503	15,577	80,954	4,586	45,341	8,514	45,608
Nov. 24, 1945	4,469	4,648	.....	15,681	83,184	4,802	45,258	8,800	47,474
Nov. 25, 1944	4,736	4,706	[4]221,431	14,765	79,711	4,491	46,513	9,200	63,047
Change:									
In week	—5	—45	+504	+104	+2,230	+216	—83	+286	+1,866
In year	—265	—58	—928	+916	+3,473	+311	—1,255	—400	—15,573
In year	—5.6%	—1.2%	—0.4%	+6.2%	+4.3%	+6.9%	—2.7%	—4.3%	—24.6%

[1] All time peak. [2] Lowest between January, 1922 and July 1, 1944. [3] Lowest since October, 1922, due to shutdown of six Mid-Continent states. [4] Lowest since December, 1921. [5] Stocks, November 18, 1944.

Compact to Hear Views On Submerged Lands

California's First Attorney General William W. Clary, and a representative of the Department of the Interior will discuss the question of ownership of submerged lands at the second day of the Interstate Oil Compact Commission quarterly meeting in Wichita, Kansas, December 13-14. Governor Andrew F. Schoeppel of Kansas, commission chairman, termed the question "one of the most important matters confronting the industry" in explaining that the commission "seeks to have presented a full picture of both sides of the question."

"Ours is an open mind," he declared, "and as a voluntary cooperative agency of the people we desire to hear representatives of opposing sides present their views."

Phillips Takes Option

Phillips Petroleum Company is reported to have been granted an option on 420,000 shares of stock of Shamrock Oil and Gas Corporation, at $13.75 a share.

Tulsa Firm Constructing Sioux City, Iowa, Line

Construction by Midwestern Engineers, Tulsa, of 58 miles of eight-inch natural gas line for Great Lake Pipe Line Company from Sioux City, Iowa, is well under way and crews are moving in to lay the 52-mile loop line from Paola, Kansas, to Kansas City, Missouri.

Work is also progressing rapidly on the laying of 15,840 feet of ten-inch gas main at Zurich, Illinois, for the Public Service Company of Northern Illinois.

Midwestern also has been awarded contract for construction of a 4½-inch pipe line from the Wisconsin-Illinois state line near Geneva, Wisconsin, to Lake Geneva, for the Wisconsin Southern Gas Company, and a contract from Natural Gas Pipeline Company of America for the installation of two 20-inch line railroad crossings near Marengo and Woodstock, Illinois, and three-inch and four-inch lines near Genoa, Wisconsin. Work on these projects is expected to begin shortly.

17-Mile Rio Grande Valley Line Ready for Operation

South Texas Pipe Line company's new 17-mile line in the Rio Grande Valley is ready for operation. The line will transport Starr County, Texas, crude from the Continental Pipe Line Company's trunk line south of Donna to the McBride Refining Company at La Blanca, east of Edinburg.

A 10,000-gallon storage tank has been installed at the Conoco pump station south of Donna. The line from the tank to the refinery will have a capacity of 2400 barrels daily. Another 10,000-gallon tank has been erected at La Blanca to receive the crude.

Tri-State Construction Planned by Empire Firm

Empire Pipeline Company announces an extensive construction program including new lines and additional tanks and pumping equipment in Louisiana, Texas and Oklahoma.

Work is progressing satisfactorily on the 65 miles of 12-inch line from Sour Lake, Texas, to the Cities Service Refinery Corporation's plant at Lake Charles, La. At Sour Lake a 675-horsepower Diesel unit driving a two-stage centrifugal pump is being installed with a duplicate unit scheduled for installation when it becomes available. Four 55,000-barrel tanks are near completion while plans are being made to erect four 80,000-barrel tanks at Sour Lake.

Work has started on the construction of an intermediate station to be located near Orange, Texas, midway between Sour Lake and Lake Charles. The new station will consist of two four-stage centrifugal pumps driven by two 800-horsepower synchronous motors, thus increasing the capacity of the line to more than 70,000 barrels a day.

At the Bumpus tank farm in the East Texas pool, tank grades and fire walls are being constructed prior to the erection of three additional 80,000-barrel tanks to facilitate handling of crude to be received from the Arkansas Pipeline Corporation.

Rights-of-way have been obtained for five miles of four-inch line from the Coates-Cimarron eight-inch line to the Evansville field near Guthrie and construction is now under way.

Additional pumping facilities are being installed at three Oklahoma mainline stations. Two 4 x 8 three-cylinder power pumps driven by 120-horsepower gas engines are being set at the Cimarron pump station, each with a capacity of 7000 barrels of oil daily; one 5 x 10 duplex pump is being installed at the Coates pump station, while a similar unit is to be located at the Blanken pump station.

Reynosa Denied Rail Group Depositions for Hearing

A request by the Reynosa Pipe Line Company for depositions of three Texas Railroad Commissioners in Austin for hearing on the firm's application to export natural gas to Mexico, has been denied by the Federal Power Commission.

The hearing will be held in Washington December 12, and Commissioners Olin Culberson, Ernest O. Thompson, and Beauford Jester will participate. Reynosa has applied for FPC authorization to export up to 60 million cubic feet of natural gas a day from Texas to Mexico.

West Texas Line Laid

A 1⅞-mile pipe line has been laid to The Atlantic Refining Company's Devonian-Ellenburger discovery in east Crane County, Texas, by the Texas-New Mexico Pipe Line Company, to a connection with that company's Wink-Crane trunk line. Allowable will be 180 barrels per day from the Devonian and 220 barrels from the Ellenburger, run to the account of the crude oil marketing division of Sinclair Prairie Oil Company.

Plant Expansion Approved

Peerless Carbon Company has been authorized by the Kansas Corporation Commission to expand its carbon black plant at Hickok. The company plans to drill two additional gas wells and to install eight new burner houses. Peerless' original plant first went into operation in 1937 using the roller-type system with 18 burner houses.

Egloff to Speak

Dr. Gustav Egloff, petroleum technologist and inventer, of Chicago, will address the annual meeting of the Rocky Mountain Oil and Gas Association which will be held December 7-8 in Casper, Wyoming, on the topic of "Peacetime Petroleum Products."

PIPE LINES

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SPANG

"it buckled— but didn't break!

The National Supply Company

Dear Sir:

In regard to your inquiry of the tubing blowout in our [redacted] well [redacted]

We were pulling the 2-1/2" Spang Chalfant tubing and a packer in this well and had 1008 ft. left to pull when it suddenly started to blow the tubing from the well. After the excitement had died down, and we had looked the situation over, we found that the top joint of the tubing or the joint that had the elevator on it was still on the rig floor and the bottom joint or the joint that had the perforation on it was blown about 300 ft. from the well and lodged in a tree. The tubing between the well and the tree was twisted and curved in all kinds of shapes and there was not a break or a loose joint in the whole string.

When the tubing first started to blow out, it had to double up and blow out through the top of the rig in a hair-pin shape in order for the joint with the elevator on it to stay in the rig and the rest of the tubing blow out of the hole. It did not damage the rig very much, although it blew the crown block off which fell on the pulling machine, damaging it some.

As you can see in the picture, there is one complete loop of the tubing in the rig itself and there were 6 or 7 more coils twisted around on the ground to the left of the picture. We have subsequently cut this bent tubing in short enough lengths so that we can handle it and have straightened it and are using it for a gas line.

In my 22 years of experience in the oil business, I have never seen a string of tubing or pipe of any kind hold together like this did which is a very good advertisement for Spang-Chalfant. I am sorry I could not get additional pictures but the tubing is back in the trees and in snow so I could not get any more good pictures.

Very truly yours,

[redacted]

☆ Oklahoma

Noble and Garvin Counties May Be Given New Pools

Noble, Garvin counties have prospective pool openers; Pottawatomie wildcat has oil show; wildcat showing east of Lucien; Garfield County test may open new area southwest of Hunter.

Noble County: Deep Rock Oil Corporation's White 1, SW NE NE 19-23n-2w, looms as an important pool opener about 2 miles southwest of the Billings field. The wildcat topped the Wilcox sand at 4415 feet. A drill-stem test at 4415-27 feet recovered 12 million cubic feet of gas. Operator drilled deeper and cored from 4429-4450 feet, took a second test between 4434-50 feet, and recovered strong gas and an estimated 30 barrels of clean oil an hour. Production string has been set for a test.

Garvin County: East of the Antioch pool discovered earlier in the year, Sohio Petroleum Company's Tolbert 1, NE NW NE 9-3n-1w, is rated a prospective pool opener. On initial drill-stem test from Simpson sand between 4441-4500 feet, the well made gas in 2 minutes plus 10 feet of oil and gas-cut mud. Drilled deeper and again drill-stem tested, the wildcat showed for nearly 6 million cubic feet of gas per day from 4493-4547 feet. Hole then was cored from 4547-54 feet for 7 feet of stained sand; then cored from 4554-64 feet for 8½ feet of stained sand. A drill-stem test at 4564 feet recovered 4200 feet of salt water with only a scum of oil. Should the bottom horizons prove unprofitable operators plan to test higher up the hole.

Garfield County: The Atlantic Refining Company's Schmidt 1, SE SE SW 25-24n-5w, wildcat about 3 miles southwest of Hunter, has been checking higher than other dry holes in the general area. After logging heavy gas and high-gravity green oil from Wilcox sand between 6108-53 feet, operator set pipe at 6302 feet, plugged back to 6244 feet and after running tubing, perforated opposite 6140-48 feet. Gas showed immediately after swabbing got under way but crews lost the swab and the well was fishing.

Pottawatomie County: Good oil shows were reported at James F. Smith's Kirker 1, SW SE NW 3-7n-3e, about 2½ miles west of the Romulus pool. The well is of more than usual interest since the showing is from the Hunton lime, productive zone in the West Edmond pool northwest. Hunton was topped at 4540 feet with the productive Bois d'Arc section logged at 4540-90 feet, total depth. Following electrical survey operator set pipe and perforated between 4546-63 feet to swab some oil. Testing continues.

Lucien Area: About 4 miles east of Lucien in Noble County, Renco Oil Company may open a new Cleveland sand pool at Ryerson 1, NW NE NW 31-20n-1w. The wildcat was drilled to 5280 feet in wet Wilcox sand. Operator plugged back and perforated the Cleveland at 4310-24 feet to get a good oil show. Pipe was then shot with nitro and crews were bailing clean oil. Testing continues.

Kiowa County: Fox & Fox have definitely established a new oil area 6 miles southwest of Carnegie at Pounds 1-A, NW SW SW 36-7n-14w, official pool opener for the Carnegie Southwest field. Drilled to 784 feet, total depth, operator tested tested the Granite Wash formation between 768-84 feet to complete for 100 barrels per day, natural.

Seminole County: Gillespie & Sons opened a small gas field about a mile south of the Sasakwa pool. Patton 1, SE NW SE 18-6n-8e, was completed for an estimate 6 million cubic feet of gas per day from Gilcrease sand between 2740-55 feet. Sand was logged at 2738 feet and the hole carried to 2985 feet, total depth, and plugged back.

Hughes County: Iron Drilling Company's Davis 1, SE NE NW 15-6n-8e, Southeast Spaulding pool outpost, was showing for better than 200 barrels on a pumping test from Booch sand topped at 2590 feet. Producing interval is between 2590-2526 feet with the hole bottomed at 2630 feet. Before installing pumping unit the well bailed considerable oil.

☆ Kansas

Test on Wichita Outskirts May Become Field Opener

New field looms northeast of Wichita; Skelly may open gas pool in Medicine Lodge area; Coralena has prospective pool opener north of Graham; Russell County wildcat swabs 3 barrels of oil an hour from Lansing lime.

Sedgwick County: Beech Aircraft Corporation set pipe and was preparing for production test at McLean 1, NW SE NW 1-27s-1e, on the northeastern outskirts of the city of Wichita. Topping saturated sand in the Pennsylvanian series between 2975-79 feet, drill-stem tests recovered considerable oil. The hole was drilled to 2968 feet for final test.

Barber County: Skelly Oil Company may open a new gas field 2 miles east of the big Medicine Lodge gas area at Boggs 1, NW NW NE 8-33s-12e. It stopped at 4493 feet, after finding the Mississippi lime at 4471 feet, and a drill-

Wells Completed in United States in Week Ending December 1, 1945

Data preliminary and subject to revision. Revised and more complete data on all completions shown in monthly summary of drilling, published in second issue of each month. More detailed data on wildcats published in third issue of each month.

State or District	FIELD COMPLETIONS: New Wells *Oil	Gas	†Input	Dry	Total	Old Wells Deepened	WILDCAT COMPLETIONS *Oil	Gas	Dry	Total	ALL COMPLETIONS This Week	Last Week	Cumulative This Year	Cumulative Last Year
Alabama	....	....	....	....	....	....	....	....	2	2	2	1	36	35
Arizona	....	....	....	....	....	....	....	....	....	....	....	....	....	6
Arkansas	1	....	....	1	2	....	....	....	....	....	2	....	175	210
California	26	1	....	2	29	....	1	....	5	6	35	39	1,965	1,889
Colorado	....	....	....	....	....	....	....	....	....	....	....	2	45	25
Florida	....	....	....	....	....	....	....	....	....	....	....	....	14	3
Georgia	....	....	....	....	....	....	....	....	....	....	....	....	6	8
Illinois	22	....	1	5	28	....	2	....	5	7	35	54	1,737	1,864
Indiana	1	....	....	1	2	....	1	1	2	4	6	....	284	311
Iowa	....	....	....	....	....	....	....	....	....	....	....	....	1	2
Kansas	13	4	1	7	25	2	1	....	11	12	39	39	1,581	1,601
Kentucky	13	....	....	4	17	....	....	....	....	....	17	....	564	755
Louisiana	9	1	....	5	15	1	1	....	3	4	20	22	976	723
North Louisiana	5	1	....	3	9	....	....	....	3	3	12	16	405	267
South Louisiana	4	....	....	2	6	1	1	....	....	1	8	6	571	456
Michigan	2	1	....	2	5	....	....	....	5	5	10	14	711	635
Mississippi	4	....	....	1	5	....	....	....	1	1	6	9	351	195
Missouri	....	1	....	1	2	....	....	....	4	4	6	....	52	40
Montana	2	....	....	....	2	....	....	....	....	....	2	6	223	314
Nebraska	....	....	....	1	1	....	....	....	....	....	1	....	4	15
New Mexico	6	....	....	1	7	....	....	....	2	2	9	4	388	385
New York	15	....	10	....	25	....	....	....	....	....	25	....	1,029	1,163
North Carolina	....	....	....	....	....	....	....	....	....	....	....	....	1	....
Ohio	6	4	....	11	21	....	....	....	....	....	21	....	888	935
Oklahoma	19	3	....	14	36	3	....	....	5	5	44	53	2,160	1,716
Pennsylvania	27	9	15	3	54	....	....	....	....	....	54	....	2,637	2,847
South Dakota	....	....	....	....	....	....	....	....	....	....	....	....	1	....
Tennessee	....	....	....	....	....	....	....	....	....	....	....	....	3	9
Texas	100	4	....	33	137	2	4	4	18	26	165	104	6,743	5,718
E.Tex.Bor.Co. 's	....	1	....	1	2	....	....	....	2	2	4	2	113	31
E. Texas Field	....	....	....	....	....	....	....	....	....	....	....	....	....	4
Rest of E. Texas	5	....	....	....	5	....	1	....	2	3	8	6	228	258
North Texas	26	....	....	16	42	....	....	....	1	1	43	33	1,645	1,297
W. Central Tex.	3	....	....	2	5	....	1	....	2	3	8	12	438	395
West Texas	40	....	....	6	46	2	....	1	1	2	50	6	1,594	1,504
Tex. Panhandle	5	....	....	3	8	....	....	....	....	....	8	3	558	299
G. Coast, Upper	4	....	....	2	6	....	1	....	2	3	9	15	649	560
G. Coast, Lower	14	2	....	2	18	....	1	1	4	6	24	17	983	850
Southwest Texas	3	1	....	1	5	....	....	1	3	4	9	8	447	423
S. Central Tex.	....	....	....	....	....	....	....	1	1	2	2	2	88	97
Utah	....	....	....	....	....	....	....	....	....	....	....	....	....	1
Washington	....	....	....	....	....	....	....	....	....	....	....	1	....	....
West Virginia	2	15	....	7	24	....	....	....	....	....	24	....	734	897
Wyoming	6	....	....	1	7	....	....	....	....	....	7	8	185	158
Total U. S.	274	43	27	100	444	8	10	5	63	78	530	355	23,495	22,460

* Includes distillate wells. † Includes salt water disposal wells.

stem test showed considerable gas. No oil was reported. Production string has been set and cemented at 4472 feet.

Russell County: About 2 miles north of the Gorham pool, Coralene Oil Company's Olson 1, CSL SE SE 23-13n-15w, swabbed an estimated 25 barrels of oil daily from Arbuckle lime topped at 3334 feet. Operator acidized between 3334-37 feet and plans to continue testing with prospects that additional acid treatment may be given the wildcat.

Another pool opener loomed for the county at Gough Davis' Krug 1, NEC 3-13s-14w, 3 miles north of the Russell pool. The wildcat was reported swabbing about 3 barrels of oil an hour plus some water from Lansing lime between 2829-34 feet. Bottom hole plug may be set to get a water shut off.

Pawnee County: J. M. Huber Corporation has recompleted Katchelman 1, NW NW SW 34-22s-16w, pool opener for the Shady field which was originally completed as a 100-barrel daily pumper from the Simpson. Operator deepened to the Arbuckle lime and completed for an estimated 35 million cubic feet of gas daily from 4059-4107 feet. During completion the test swabbed 30 barrels of 35-gravity oil in 6 hours.

Missouri

O. R. Newcomer et al's Zeikie 1, C SW NW 27-55n-29w, on the west outskirts of the shallow Polo gas pool, Caldwell County, set production string at 911 feet and was drilling slowly below 922 feet looking for the sand. Todd, Leuring et al's Benson 1, NW NE NW 30-55n-29w, about 2 miles west of the Newcomer test, was drilling below 110 feet.

Park County: Missouri Valley Gas & Oil Company's Brown 1, SW NE SW 7-51n-23w, a gas well being deepened in the Prairie Point gas pool northeast of Parkville, was drilling below 990 feet.

Nodaway County: J. E. Palensky of Vermillion, South Dakota, has completed a deal to drill a wildcat test at Wallace 1, NW NW 10-65n-36w, about 8 miles northwest of Maryville. Dan Short was moving in rotary from Tarkio to drill the test.

Nebraska

Powell Oil Company was entering its sixth week of fishing at Bohrer 1, E½ SE NW 10-1n-14e, Richardson County, an old Hunton lime oil producer in the Ogle pool which is being deepened. The test is in northeast Nebraska south of Dawson.

Stripper Increases

Several stripper well areas have been granted a crude oil price increase by the Office of Price Administration under the stripper well subsidy program.

Effective November 1, increases were set for the Empire pool, Stephens County, from 25 to 35 cents per barrel; Barker pool, Osage County, from 25 to 35 cents per barrel; East St. Louis pool, from 20 to 25 cents per barrel; North St. Louis pool, from 25 to 35 cents per barrel; Lovell pool from 20 to 25 cents per barrel. Also effective November 1, subsidy was granted for the first time to the St. Louis pool proper at 20 cents per barrel; North March, 20 cents per barrel and Atlantic and Signal Hill, 20 cents per barrel.

☆ New Mexico

New Lea County Wildcat Projected to Ellenburger

Mid-Continent Petroleum Corporation has located a wildcat in Lea County, projected to the Ellenburger, or 8500 feet. The well, A. L. Christmas 1, is 1980 feet from the south and east lines of Sec. 17, T-22-S, R-37-E, and is in the Eunice district. It will be approximately 1½ miles southwest of Penrose 1, Federal-Penrose discovery for flowing production from the Ellenburger in that area.

Santa Fe County: Richfield Oil Corporation's Lee 2, 330 feet from the south line and 1530 feet from the west line, SW SE SW 14-14n-11e, was abandoned in Pre-Cambrian Schist at 2725 feet. Federal Lee 1, being drilled by the same company, in C NW NW 25-14n-11e, was abandoned in granite at 2588 feet.

☆ West Texas

Dawson County Is Given First Flowing Producer

Dawson County gets first flowing producer; Ector County wildcat taking second test after slight showing; Ellenburger test in Fullerton area is favorable; Keystone-Ellenburger field in Winkler County extended ¼-mile; Doss northwest extension in Gaines County flows.

Dawson County: With a flow of approximately 96 barrels of clean oil from the San Andres at 4906 feet in 24 hours, Coates & Foster C. H. Cole 1, has the first flowing production in the county. The well is in Sec. 49, Block M, EL&RR survey, north and west of the Welch pool, and the operators have made location for Cole 2, 1980 feet from the south and west lines of Sec. 49. Production in Cole 1 is from the San Andres section of the Permian. The well responded after acidization with 3000 and 7000 gallons. Magnolia Petroleum Company, Cities Service Oil Company and Ralph Lowe hold acreage in the area.

Ector County: After drill-stem test at 8170-8256 feet which recovered 90 feet of drilling mud with a slight oil scum, Stanolind Oil and Gas Company's Williamson 1, 10,000-foot wildcat project northwest of Goldsmith, in Sec. 5, Block 45, T-1-N, T&P survey, was drilling in the Devonian below 8260 feet.

In the Cummins area, Stanolind & Landreth's Scharbauer 3-Q, Sec. 12, Block A, PSL survey, recovered about 10 barrels of oil by swabbing from 8144 feet. The hole failed to fill up a second time, however, and preparations were being made to shoot and treat for another try.

Fullerton Oil Company's Wilson 9-A was drilling after coring at 9935-45 feet, with no reports on results of the core. Located on the west side of the Fullerton area in Andrews County, the test flowed from 75 to 100 barrels of oil from the lower Ordovician at 9875-9935 feet. This is the deepest production found in the field. The test probably will be carried to the Ellenburger.

Winkler County: Sinclair Prairie Oil Company's Walton 10-A kicked off and flowed approximately 92 barrels of oil through a 1-inch choke from perforations with 612 shots at 9925-10,028 feet, and finally gauged 562 barrels in 6 hours. The well is on the northwest side of the Keystone field and will extend production about ¼-mile. Walton 9-A, being drilled by the same company, is waiting on cement after running 5½-inch casing to 10,009 feet.

Gaines County: After flowing 8 barrels hourly, Humble Oil & Refining Company's Fee 1-B, ⅜-mile extension to the Doss, Clear Fork lime pool, was being put on production from perforations between 7035-7125 feet. The well was acidized with 2000 and 6000 gallons through four perforations to the foot of casing.

The Texas Company extended the Robertson field in Robertson 3, 2959 feet southwest of nearest production, as a pumper good for 189 barrels, from pay topped at 5875 feet and drilled to 6236 feet. The well was treated with 3000 gallons of acid.

Pecos County: A deep test, probably 8500 feet to the Ellenburger, will be drilled in the Taylor-Link pool by R. N. Beakley and J. E. Whiteside, in University-Lee 1, located 660 feet from the north and west lines of Sec. 31, Block 16, University Lands. Humble is reported to be helping with the test. Deep rights in the area are held by several of the major companies including Shell, Stanolind, Standard Oil Company of Texas and Continental Oil Company.

Helmerich & Payne's White Baker "C" 8 flowed 117 barrels on a 24-hour test from perforations at 7612-28 feet. The well was plugged back from 9811 feet in dolomite to 8021 feet. Five and one-half inch casing was cemented at 8087 feet, and one shot was made at 7620 feet. Then perforations were made with 48 shots at 7612-28 feet, and the flow resulted through a 2-inch casing outlet. Fluid pressure was 1000 pounds. The well was shut in for 24 hours and the pressure rose to 1800 pounds, and then flowed 68 barrels of oil in 2 hours through the casing outlet. Production is from the Strawn section of the Permian, and indicates a new pay for the area. The test was originally drilled by Humble in 1933-34 to the Ellenburger, and was abandoned as dry at 9811 feet. Adjacent production is all shallow.

Crane County Potential from the Devonian, in The Atlantic Refining Company's University 1-A-31, discovery test in the east-central part of the county, was 774-08 barrels flow in 24 hours, with gas-oil ratio of 700/1, gravity 47.3. Production was from perforations in pay at 8812-27 feet, 8835-52 feet and 8860-69 feet, with four shots per foot.

After acidizing with 250 gallons in the Ellenburger section, at 10,291-458 feet in open hole, the flow through a ½-inch choke was 419.85 barrels in 24 hours, gas-oil ratio 500/1, gravity 47.2.

Humble's G. H. Cowden et al 1, wildcat 1¾ miles north of production in the Crane-Cowden pool, showed no results on a drill-stem test at 8703-40 feet, open for 32 minutes, and is drilling below 8795 feet.

Texas Panhandle

H. Stekoll's No. 24 J. A. Whittenburg "L", Hutchinson County, is show-

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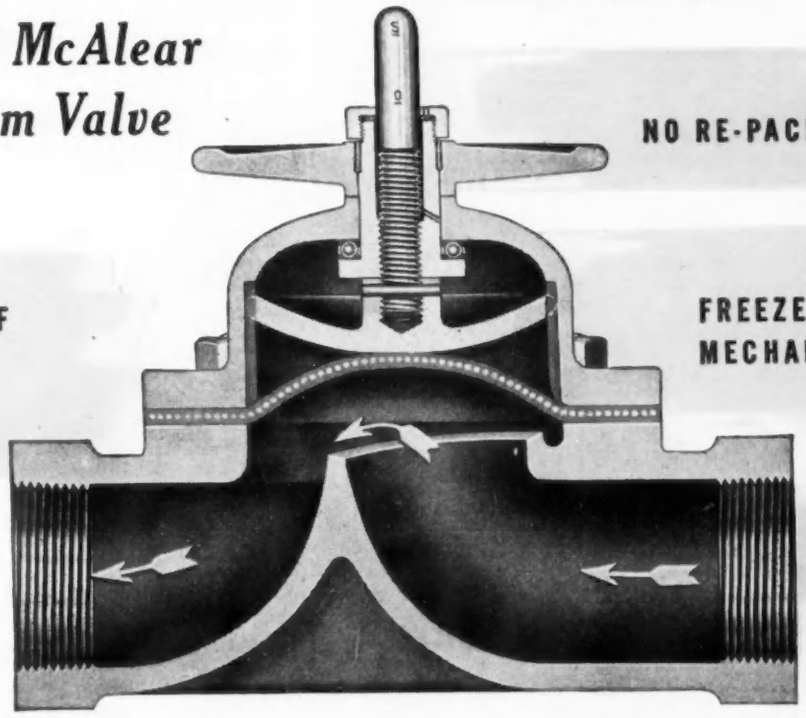

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- ★ *WATER WORKS*
- ★ *SEWAGE PLANTS*
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- ★ *PAPER MILLS, etc.*

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ing 500 feet of oil in the hole and swabbing 15 barrels of oil per day from dolomite pay topped at 2825 feet. From 2825 feet to 2928 feet the well had 700 feet of oil in the hole. It was deepened to 2948 feet without any increase and was then shot with 300 quarts of nitro.

☆ West Central Texas

Nolan County Project Is Disappointing on Test

Nolan County's bid for production not too encouraging; Jones County wildcat adds to Saddle Creek formation output; several new tests staked.

Nolan County: Sohio Petroleum Company's Irl Faver 1, failed to respond to a drill-stem test after having slight shows of oil at 5692-5700 feet. The core recovered 1 foot of lime and sand with a strong odor of oil, and 2 feet of dry lime. The test was made at 5692-5700 feet, but failed to respond. Coring was resumed from 5725-29 feet. Preparations were being made to drill on. The well is 5 miles east by south of Sweetwater. It entered the Strawn at 5661 feet with elevation of 2125 feet. A previous drill-stem test at 5670-82 feet yielded gas to the surface and the well headed. Fluid recovered showed 180 feet of oil-and-gas-cut mud and a slight amount of salt water. Location is on Block 21, C NW NW T&P Ry 50, on acreage farmed out by Hunt Oil Company from a large block.

Jones County: Approximately 2600 feet of oil was reported in the hole of Rhodes Drilling Company's W. D. Swann 1, 12 miles northwest of Merkel, after a drill-stem test. Pipe was set at 2697 feet and the plug was to be drilled. The well was originally scheduled for the Ellenburger, but it was decided to test the Saddle Creek, and the operators will atempt to make a producer from this zone.

Stephens County: Encountering a gas sand which blew an estimated 10 million cubic feet, W. J. Gourley's Kloh et al 1-A, caught fire at 3862 feet after running into the sandy lime carrying the gas. At 3768 feet 5½-inch casing had been cemented and the pay zone was topped at 3853 feet. The fire was put out and the well is now shut in.

☆ North Texas

Prospect in Sivell's Bend Shows Salt Water on Test

Prospective Strawn sand well in Sivell's Bend area shows salt water on test; other tests in various sections report good shows.

Cooke County: Mid-Continent Petroleum Corporation's J. V. Morris 1, wildcat a mile north and east of Sivell's Bend, was given a drill-stem test at 6478-82 feet and recovered 62 feet of muddy, salty water with only a very slight show of oil. After logging an oil sand at 6255-59 feet, and coring from 6259-63 feet, previously, and recovering 25 feet of heavy oil-cut mud, and 10 feet of free oil, from an earlier drill-stem test, drilling was resumed after the second test, and the well was drilling ahead, and coring after logging another oil sand at 6507-14 feet.

Montague County: Venmex Oil Company made a good producer in W. K. Kingsbury 2, in the north extension area of the Hildreth pool. The well flowed 330 barrels of oil in 3 hours through a ¾-inch choke, with casing pressure of 1000-720 pounds, gas-oil ratio 650/1, gravity 42, from conglomerate topped at 6057 feet. Total depth of the hole is 6072 feet.

National Associated Petroleum Company's R. R. Alexander 1, wildcat 2 miles south of Nocona, recovered 60 feet of oil, 60 feet of oil and gas-cut mud and recorded bottom-hole pressure of 1300 pounds, from a drill-stem test at 5795-5803 feet. The test is now drilling in conglomerate below 5820 feet.

Jack County: With abandonment of Palmer 1, on the J. C. McGinnis survey by Helmerich & Payne, the northeastern limits of the Borden Simpson pool becomes more clearly defined. The test was abandoned at 6920 feet in Ellenburger.

Another wildcat, Lesco's S. V. Vanhooser 3, 8 miles southwest of Bryson, Sec. 1, BS&FRR Company survey, was a failure at 3089 feet, plugged back depth.

Archer County: A small amount of oil was swabbed from Bridwell Oil Company's Oil Investment 1, wildcat 4 miles northwest of Archer City, at 4925 feet. Casing was perforated at 5960-66 feet with 24 shots. Top of the Caddo was at 4875 feet.

C. T. Robertson's A. D. Britton 1, ½-mile south of Holliday, flowed 120 barrels in 24 hours through open 2-inch tubing, at 4067 feet, casing pressure 200 pounds, tubing pressure 50 pounds, and gas-oil ratio 300/1, oil 40-gravity.

Clay County: Continental Oil Company's S. W. Heard "C", wildcat about 3 miles southwest of Buffalo Springs, Sec. 3222, TE&L Company survey, showed 1435 feet of oil, 300 feet of oil-cut mud and a bottom hole pressure of 2000 pounds, from a drill-stem at 5740-81 feet, with the tool open 60 minutes.

Gasoline Plants Sold

Sunflower Products Corporation, operator of gasoline plants in the Salem oil field and Benton, has been purchased by Engle Petroleum Company. Included in the purchase were two gasoline plants, real estate, offices, rotary drilling equipment and oil production. The gasoline plants are valued at more than $1,500,000 and are capable of producing 100,000 gallons of gasoline, 55,000 gallons of butane and 26,000 gallons of propane daily.

Texas Fields Named

Quintana Petroleum Corporation's new discovery in Calhoun County, Lower Texas Coast, opened by the Shofner Estate 1, B. Rodriguez survey, has been named the "Sheriff" field, Don O. Chapell, chairman of the Oil Field Nomenclature Committee of the South Texas Geological Society, has announced.

The field discovery by Taylor Refining Company's Raymond Meyer 1, A. Peets survey, in Victoria County, has been named "Marcado Creek."

☆ East Texas

Sand Flat Pool Project Continues Encouraging

Sand Flat prospect to continue testing and looks encouraging; test south of Pickton field tests salt water.

Smith County: Encouragement given by C. L. Wicyliffe's Hackett 1, prospective extension to the Sand Flat pool, continued as the well was being prepared for further testing at 9852 feet after swabbing wash water and oil. The hole was conditioned down to 7437 feet, drilled out to 7384 feet, perforated at 7277-84 feet with 56 shots, 2-inch tubing set to 7298 feet, and the tubing perforated. The fluid rose to within 3000 feet of the top and the well swabbed wash water and oil. Five and one-half inch casing was set at 7418 feet. Abandoned temporarily in 1943, the test has taken on interest since the Sand Flat area has been extended north. Production in this well would extend the field approximately 1½ miles north.

Humble Oil & Refining Company's Ramey & Boren, another Sand Flat test, is drilling in sand and shale below 5475 feet. Skelly's Chisum 9 is below 7195 feet in shale and lime, and location is being made and roads built for Chisum 10.

Shofner 1, Sinclair Prairie Oil Company test in the Chapel Hill field, which threatened to blow out, was being reconditioned with new drilling mud. The well was killed at 13,577 feet and a perforating gun was run with blank shots to test the powder and check measurements. The temperature caused the shots to go off. Inch and a quarter tubing was then rerun with a drill bit and the hole reamed to 13,403 feet. As the tubing was being withdrawn from the hole, the well kicked, and mud and water were replaced.

Hopkins County: Delta Drilling Company's Livingston 1, 5 miles west by south of the Pickton field, was drilling below 6940 feet after showing salt water on electric log to 6845 feet.

Leon County: Claude Bell et al's Brown & Carson 1, Thos. Garner survey, 3 miles southeast of Flynn, was waiting on 5½-inch casing after cementing at 7090 feet. The well was cored from 7210-13 feet with no shows, at 7213-17 feet with 1 foot show, and oil began to show in the pits. Drilling was resumed from 7217-34 feet and cores taken from 7234-50 feet had a strong gas odor. An electric log was run to 7290 feet, but showed no sand. A sidewall core of Midway and Nacatoch was taken, but no shows were reported. Total depth of the hole is 7300 feet.

E. H. Robertson et al's Wilson & Reding 1, near Cario, in the Eli Chandler survey, was drilling below 8136 feet with streaks of sand showing. Good porosity was indicated at 7811-31, 7834-37, and at 7869-98 feet.

Drilling Firm Formed

W. A. Stockard of Houston, has announced the incorporation of the Big "6" Drilling Company. Officers include H. Andres, president, J. Brown Cutbirth, H. L. Young and Stockard.

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☆East Texas Border

Pettit Wildcat Swabbing; Carthage Test Abandoned

Pettit wildcat in Panola County swabbing to test shows; prospective oil producer in Carthage field is abandoned.

Panola County: The Ohio Oil Company is swabbing in J. O. Britton 1, William Taylor survey, wildcat 1¼ miles northeast of Dotson. A previous test recovered 42.1-gravity oil through 108 perforations from 6542-68 feet, after treatment with 10,000 gallons of acid. Operators have reacidized with 4000 gallons of acid. Total depth is 7001 feet.

Sun Oil Company has abandoned Sallie J. Neal A-1, John R. Garner survey, which once was considered an oil producer from the Bacon lime. On an 18-minute drill-stem test the well recovered 3640 feet fo 32.8-gravity pipe line oil. A production string of 5½-inch casing was set at 4969 feet and plug drilled, but no further commercial shows of oil or gas were obtainable. Efforts to rework were also failures.

Harrison County: Rogers Lacy is moving materials to Newman 1, Whelan field, North survey, 1 mile south and east of Lacy's Quinn 1 gas-distillate producer. D. E. and R. J. Whelan are perforating to retest at William Peal Estate 1, Betty Humphries survey, the field's discovery well. Last series of perforations were from 7722-40 feet. Placid Oil Company's Mattie Lee Knox et al 1, Benjamine Parker survey, 3 miles southwest of Harleton, is drilling below 3610 feet in lime.

Marion County: Rogers Lacy's wildcat, Scott 1, L. A. McLaughlin survey, is coring below 7170 feet. Magnolia Petroleum Company's S. L. Orr 1, wildcat, R. B. Fowler survey, is drilling below 5485 feet.

Shelby County: Hiawatha Oil Company's Pickering Lumber Company 1, W. J. Brittian survey, wildcat, continues drilling without shows below 2350 feet.

Humble Oil & Refining Company's Pickering Lumber Company 1, St. Francois survey, is still conditioning hole for drilling. The well has had several operational difficulties. A blowout occurred at 6613-37 feet, believed to be in the Pettit lime, and a kick was registered at 10,986 feet, causing operators to lose returns, though no gas shows were noticeable. The test was plugged back to 8174 feet and drilled out to 8380 feet, still losing returns. This operation was repeated with the same result. Operators squeezed and drilled out to 8380 and lost returns. Drill pipe was stuck during a drill-out to 8708 feet. Hole has been squeezed from 8317 to 10,906 feet.

☆South Central Texas

Guadalupe County Shallow Wildcat Is Projected

Shallow wildcat planned in Guadalupe County; Humble drills deeper in Atascosa County test; Milam County gets new wildcat.

Guadalupe County: Cecil Hagen and D. D. Feldman has spotted a shallow wildcat 4 miles north of Seguin. It is the Paul Alves Estate 1 on a 115-acre lease in the John Ussery survey.

This county lost an active test with the abandonment of Leon V. Manry's Effie Williamson 1, southeast of Seguin. Total depth was 3000 feet in the Edwards lime.

Atascosa County: Humble Oil & Refining Company's Henry Schorsch 1, Edward Estada survey, wildcat southwest of Jourdanton, was drilling below 7410 feet in Edwards lime after tests at 7384-91 feet and 7391-98 feet failed to show for commercial production.

In the Charlotte field, Humble spotted W. E. Pound 1 on a 200-acre lease in the Antonio Estrada survey.

Bexar County: Chenoweth & Harroun's Max Blum 1, deep test in the Ras Ridge area, was drilling below 5810 feet in sandy shale.

Lee County: Seaboard Oil Corporation's Paul Hendrick 1, Frans Potthast survey, 8 miles north of Paige, was drilling below 8443 feet in hard sand.

Milam County: Holcomb & Howard Oil Company has staked a 2000-foot wildcat test 9 miles west of Rockdale. It is the J. L. Byrd 1 on a 189-acre lease in the J. J. Acosta survey.

☆ Southwest Texas

Oil Show Is Reported in Starr County Wildcat

Oil show reported in Starr County wildcat; Duval County gains two exploratory tests; McMullen County tests run log.

Starr County: Interest in this area now is focused on W. H. Holland's M. M. Garcia 1, wildcat in Porcion 91, about 15 miles northeast of Rio Grande City. Although no accurate information is available, reports say some oil was recovered on a drill-stem test just below 4000 feet.

Arkansas Fuel Oil Company has located F. F. Martinez 16 in the North Rincon field.

Duval County: Sid Katz of San Antonio has spotted W. R. Peters 1, wildcat, on a 1000-acre lease in Survey 40 about 10 miles southwest of Freer.

C. S. Sollars and associates have spotted Alonzo Taylor 1, wildcat, about 7 miles north of Hebbronville, on a 720-acre lease in the El Mesquite survey.

In the Benavides field, Hiawatha Oil and Gas Company staked George Parr 32.

Argo Oil Corporation's John E. Murphy 1-C, wildcat, 5 miles northeast of Seven Sisters, was drilling below 7000 feet in shale.

Gravis & Mitchell's Hinojosa 1, A. M. Perez survey, wildcat, 12 miles southwest of San Diego, a tight well, was reported drilling below 4320 feet in sandy shale.

McMullen County: Plymouth Oil Company's Harry Ezzell, Agent 1-A, wildcat, 6 miles southwest of Calliham, was running an electrical log around 7200 feet.

☆ Lower Texas Coast

Nueces and Bee Counties Wildcats to Receive Tests

Testing slated on Nueces County wildcat; Humble opens new sand at Mariposa; gas and condensate recovered in Goliad County well; test due on Bee County wildcat.

Nueces County: Testing is under way at The Atlantic Refining Company's James H. Ewing 1, wildcat in the M. L. Lopez de Herrera Grant, 3 miles southwest of Robstown. Five-inch liner was landed on bottom at 8276 feet with 7-inch protection string cemented at 6318 feet.

Brooks County: Humble Oil & Refin-

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ing Company has completed D. J. Sullivan 2-C, Mariposa field, in a new oil sand. The well flowed 240 barrels of 37.4-gravity oil daily through a ⅛-inch choke from 9101 feet. Tubing pressure was 2650 pounds with gas-oil ratio being 1350/1.

Goliad County: Magnolia Petroleum Company's R. F. Irby 1, wildcat in the J. Callahan survey, 12 miles southwest of Goliad, is credited with recovering gas and condensate on a test at 9900-10 feet. Total depth is 11,726 feet with 7-inch casing set at 10,588 feet. Several tests, showing gas and condensate, have been made below the 9900-foot sand.

Location has been made by Jay Simmons for an 8400-foot Wilcox sand wildcat 6 miles southwest of Weesache. It it the Mary Poehler 1 on a 78-acre tract in the Jacob Fifer survey.

Calhoun County: Added importance is placed on the recently opened Sheriff field, near Port Lavaca, at Quintana Petroleum Corporation's Shofner Estate 1, with the company applying for a dual-sand permit for Henry C. Boyd 1, offset to the discovery well. This test now is starting operations. The Shofner 1 was completed in perforations at 5710-25 feet.

Bee County: Sam E. Wilson, Jr., is slated to set casing soon in Page Estate 1, C. Rivas survey, wildcat 2 miles southeast of Cadiz, to test shows of oil and gas in the Hockley formation between 3690-3715 feet.

W. C. McBride, Inc.'s, R. A. Hall 1, J. W. Cook survey, wildcat 4 miles northeast of Beeville, was preparing to spud.

Humble has completed McCelvey Estate 1, north offset to Tom Graham's discovery in the Theis field, for 66 barrels of 35.4-gravity oil daily through a 5/32-inch choke from perforations above 3586 feet.

Jim Wells County: Shell Oil Company's William Van Hoogenhuyze 1, wildcat 5 miles east of the LaGloria field, is conditioning mud after attempting to blow out at 9050 feet.

☆ Upper Texas Coast

Hardin County Discovery Well Is Given Final Gauge

Final gauge made on Hardin County discovery well; Humble testing Montgomery County wildcat; important wells in Old Ocean field testing.

Hardin County: Final potential gauge has been made on Pan American Production Company's Olive Sterenberg Lumber Company 1, P. S. Watts survey, pool opener northwest of the West Silsbee field. The well gauged 596 barrels of 44.5-gravity oil daily through a 14/64-inch choke with tubing pressure 3500 pounds. Total depth was 10,048 feet with pipe set at 9949 feet and completion made in open hole.

Montgomery County: Humble Oil & Refining Company's E. L. Bender et al 2, wildcat in the Rayford area, has casing perforated at 5950-56 feet for a second completion attempt. The well failed to flow after swabbing in initial perforations at 5954-57 feet. Total depth is 7554 feet with 5½-inch casing set at 6064 feet.

Brazoria County: Magnolia Petroleum Company and J. S. Abercrombie Com-

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pany's BRLD 4-C, in the Old Ocean field, was perforating after setting casing on bottom at 11,011 feet to test a deep sand.

Tide Water Associated Oil Company's M. M. Hardin 2, about ¼ mile southwest of the company's Hardin 1, Old Ocean field, casing set at 10,890 feet for completion.

Humble's Leona Carter 1, north of gas and distillate production in the Pledger field, has casing set at 6880 feet for completion. Total depth is 6903 feet.

San Jacinto County: Navarro Oil Company's Foster Lumber Company 3, southeast of Cockfield sand production at Cold Spring, tested gas through perforations at 7719-24 feet in the Wilcox formation and was being squeezed for a second test.

Jefferson County: About 1½ miles northeast of the LaBelle field, Sun Oil Company will drill Broussard & Hebert 15 in the A. Hotchkiss league.

In the southeast Fannett area, Glenn H. McCarthy has completed Craigen 3 for 152 barrels of 35.1-gravity oil daily through a 5/32-inch choke from perforations at 7381-84 feet.

Harris County: Humble's Milo 10, Tomball field, deepest active test on the Gulf Coast, was drilling below 15,186 feet in sandy shale.

Abercrombie's Lenoir M. Josey, Inc., 1, Cypress area, was preparing to spud.

Fort Bend County: T. S. Loffland was preparing to start Annie E. Williams et al 1 on a 20-acre tract in the T. Barnett league, on the northeast flank of the Thompson field. It is to be drilled to the Vicksburg at 8500 feet.

☆ South Louisiana

Final Completion Made on Calcasieu Parish Strike

Final completion made on Calcasieu Parish discovery; Napoleonville flank well is testing; Lafayette Parish gains new wildcat; deep Allen Parish wildcat is running log.

Calcasieu Parish: Final completion has been made at Union Sulphur Company's Bordages 1, wildcat discovery well in 5-10s-9w. The well flowed 60.72-barrels of high-gravity oil daily through a 13/64-inch choke from perforations at 8480-90 feet. Gas-oil ratio was 23,476/1.

Max Pray, Chicago operator, has staked a Hackberry zone wildcat test in 28-10s-12w. It is the Elizabeth Yust 2, about 330 feet west of the Yust 1, drilled to 8471 feet earlier this year and abandoned.

Assumption Parish: Falcon-Seaboard Drilling Company's Ed Hebert 1, on the west flank of Napoleonville dome, 40-12s-12e, is running tubing for a completion attempt after a 25-minute drill-stem test at 6830-38 feet recovered 54 stands of fluid, with the oil testing 41-gravity, no salt water. Working pressure was 1025 pounds.

Evangeline Parish: Pan American Production Company has dually completed an old well in the Pine Prairie field. The Crowell Land & Mineral Corporation 2-C, 2-4s-1w, originally completed in the Sparta sand through perforations at 8617-38, 8646-54, and 8660-84 feet, has been finaled in Cockfield sand through perforations at 7786-7802 feet for 504 barrels of 41.8-gravity oil daily through a 16/64-inch choke.

Lafayette Parish: Raymon & Cockburn, New Orleans operators, have staked a 7500-foot wildcat in 16-11s-5e. It is the Lafayete Parish School Board 1.

Lafourche Parish: The California has completed Louisiana Delta Farms 31, Delta Farms field, for 250 barrels of 36.4-gravity oil daily through a 5/32-inch choke from perforations at 9413-30 feet.

Acadia Parish: Union Sulphur's La-Vergne 1, Bayou Mallet field, is squeezing perforations at 8855-60 feet after a drill-stem test recovered salt water.

Barnsdall-Vincent & Welch's Homeseekers Development Company 1, wildcat in the West Tepetate area, 19-7s-2w, was running electrical log at 9335 feet.

Allen Parish: Humble Oil & Refining Company's Mrs. J. A. Bel Estate 1, wildcat in the Oberlin area, bottoms at 13,083, where operator is running an electrical log. This test is credited with having picked up several shows of gas below 12,000 feet and salt water sand at 12,900 feet. Whether pipe will be set for completion attempt has not been announced.

Terrebonne Parish: Humble's Ellis Henican et al 1, outpost in the Bayou Penchant area, has been abandoned at 11,500 feet.

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Preference in making these grants will be given, other factors being equal, to smaller institutions and those of more limited financial resources for research.

☆ North Louisiana

Franklin Parish Prospect To Test Cotton Valley

Franklin Parish prospect to test Cotton Valley sands; second test at Lamar to be completed before reworking discovery.

Franklin Parish: Showings in the Paluxy sand of good stain and odor of oil indicate the opening of oil production at Gus Primos and C. W. Sharp's Baker 1, wildcat in C SW NW 20-16n-8e, 3 miles south of the Big Creek field in Richland Parish. Electrical log indicated Paluxy sand from 3540-52 feet with possible production substantiated by sidewall cores. Production casing has been cemented at 3560 feet, with total depth 3787 feet. The well is 5 miles south and 7½ miles west of the Delhi field, and 1½ miles north and 8 miles west of the Lamar field. Altas Oil & Refining Company is drilling below 1500 feet in Baker 2, C SW SE 27-16n-9e, at Lamar, a west offset to the field's dis-

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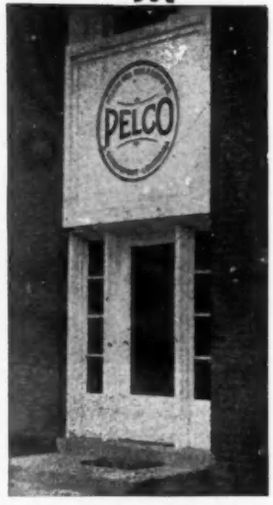

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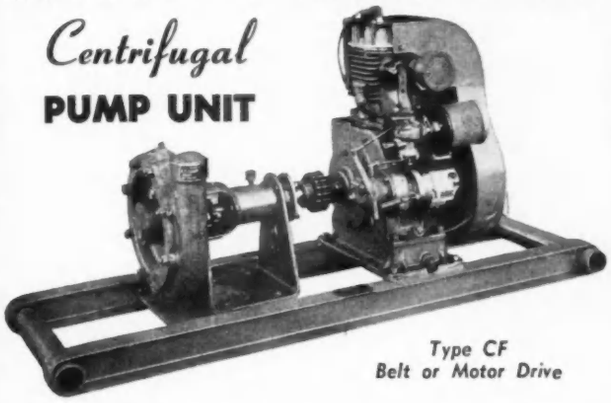

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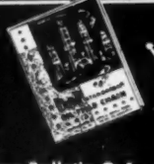

Union Bulletin O-1 covers Oil Field Chain. Ask for your copy.

UNION CHAINS

covery well, Baker 1, which will be reworked upon completion of Baker 2.

C. L. Smith is drilling below 4830 feet in Stark 1, C SE SW 26-13n-7e, wildcat, nearing the gas rock. Smith is making fast progress at Mitchell Estate 1, 28-11n-7e, and is below 4285 feet.

Gus Primos and C. W. Sharp's Butler 1, C SW NW 20-16n-8e, is reported to have reached contract depth of 3500 feet, without showings, and are running electrical log.

Caddo Parish: Union Producing Company is drilling below 7115 feet in sand and shale at Noel Estate A-1, 11-19n-16w, wildcat northwest of Longwood production, which has had indications of Pettit production at 5701-16 feet. Operators will drill to the Cotton Valley and test all horizons there.

Big West Drilling Company is below 8020 feet without showings in C. L. Ellerbe 1, deep wildcat test in the Caspiana area.

Catahoula Parish: The California Company's H. C. Eckhardt 1, C NE NE 12-9n-7e, deep wildcat test in the Sicily Island area, was abandoned at 9313 feet, after being previously abandoned at 5860 feet earlier in the year.

Bossier Parish: Barnsdall Oil Company and Associates are drilling below 6230 feet in Crystal Oil Refining Company 1, 28-21n-11w, without showings.

Big West Drilling Company's Continental American Bank & Trust Company 1, C SW NE 23-19n-11w, wildcat, is below 5250 feet.

DeSoto Parish: Spartan Drilling Company's deep wildcat B. F. Thigpen 1, C NE NW 29-12n-11w, is drilling below 8101 feet.

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HOUSTON 10, TEXAS

☆ Arkansas

Union County Is State's Most Active Wildcat Area

Deep wildcat drilling without shows; wildcats getting under way; Union County is most active wildcat area.

Union County: The Atlantic Refining Company's Goode 1, NW 6-17s-13w, Champagnolle area, Arkansas' deepest wildcat, is drilling below 5630 feet. Last two tests recovered only salt water.

The Arrow drilling Company's Union Saw Mill A-1, C SW SW NE 8-18s-12w, encountered an oil sand at 2320 feet and bailed at the rate of 1 barrel per day. The well is now at total depth of 2364 feet, and operators plan to deepen to 3600 feet.

Kerlyn Oil Company's Crossett Lumber Company 1, C SW SW SW 9-19s-10w, wildcat that has been shut down by high water, is building road to location. The test is being reworked at total depth of 5415 feet in the Cotton Valley. A 30-minute drill-stem test from 4255-90 feet recovered 96 feet of oil-cut mud and 60 feet of salt water.

Ouachita County: Skelly Oil Company's C. O. Adams 1, C NW NW NW 29-13s-18w, recovered drilling mud, no shows, on a test from 1710-28 feet, and is drilling below 2722 feet.

Logan County: M. J. Reinhart's Nagle 1, C NE NE 11-8n-24w, is below 3545 feet without showings.

Miller County: Deep Rock Oil Corporation is drilling at 200 feet in its wildcat, Mrs. W. D. McClouth 1, C SE SE SE 26-15s-28w.

G. Anthony et al's A. W. Smith 1, 24-15s-26w, is waiting on cement at 4035 feet. Anhydrite was topped at 2757 feet.

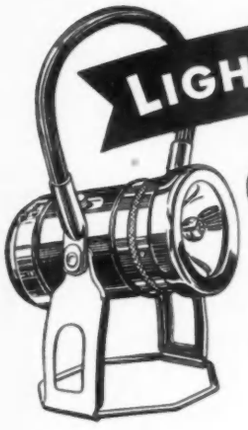
☆ Mississippi

Adams County More Active; LeFlore Test Running High

Adams County shows steadily increasing activity; structures in LeFlore County prospect reported running high; new attempt made to reactivate Flora field; Texas operators enter oil play in Heidelberg.

Adams County: Roeser & Pendleton-Sohio Petroleum Company's Baker-Maier 1, NWc 34-6n-2w, is reported ready to bottom in the 10,000-foot zone. No shows have been indicated in lower horizons and it is reported that electrical log showed water in the Tuscaloosa section just below 10,000 feet. The well will continue a couple of hundred feet and if nothing encouraging is developed, the hole may be plugged back to the Wilcox zone at 4630-46 feet where interesting oil shows were encountered. The Baker-Maier 1 is about 8 miles east of Natchez. Phillips Petroleum Company's Davey 1, 46-8n-2w, wildcat headed for the 10,000-foot level, is drilling below 8175 feet with no shows. A test of the Wilcox horizon farther up the hole yielded only salt water.

Humble Oil & Refining Company's Mrs. C. L. S. McKittrick 1, SEc 12-6n-3w, Carthage Point field, which is seeking production to 11,000 feet, is drilling at 8805 feet after topping chalk at 8530 feet. No shows have been in-



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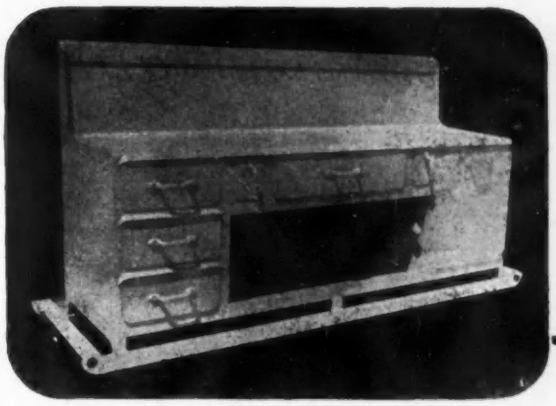

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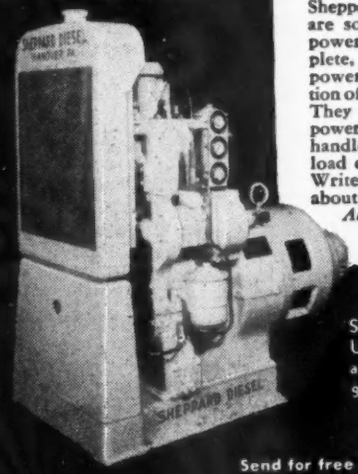

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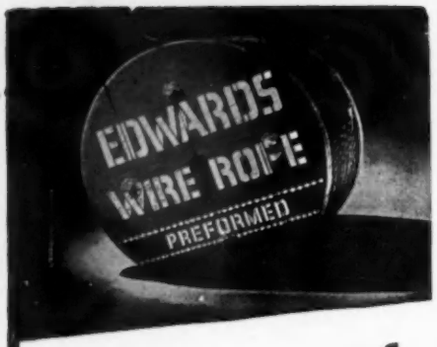

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dicated. This is Humble's first venture in this small field.

In the Cranfield field The California Company's George W. Armstrong 1, 27-7n-1w, is drilling surface hole for a test of the Massive sand. The well, if successfully completed, will extend the field slightly north. California's Ella G. Lees 10, 29-7n-1w, Cranfield, has been successfully completed with an initial production of 289 barrels of oil per day. Gravity of the oil is 37.7 and gas-oil ratio is 1100/1.

LeFlore County S. J. Tucker's W. N. Pillow 1, NE NW 8-19n-1w, is drilling below 4497 feet with no shows indicated. The test, which is just west of Greenwood, is arousing interest since it was reported that the Eutaw zone was logged about 100 feet higher than anticipated.

Smith County: Hunt Oil Company's Smith County Oil Company 3, SWc 4-2n-8e, is drilling in the 6000-foot zone after topping the Eutaw at 5948 feet, and is reported high on structure. No shows have been reported. Gulf Refining Company's O. P. Foley 1, SE NW 8-10n-13w, which is being deepened after being abandoned at 2269 feet early this year, is drilling below 5143 feet in shale with no shows. The well is headed for the Tuscaloosa horizon.

Madison County: Leonard Jones' J. R. Anderson 1, NE SE 2-8n-1w, near the discovery well in the Flora field, is drilling below 1037 feet. The field is about 3 miles east of the town of Flora on a block leased by the Love Petroleum Company, which successfully completed the discovery well, Anderson 1, the only producer. About 300 barrels of 26-gravity oil per day were produced for a time, but finally production went into salt water and there has been no further exploitation.

Franklin County: California's Homochito Lumber Company 1, 27-7n-1e, has been issued permit for an attempt to extend production of the Cranfield field 1½ miles northeast into Franklin County. The location is north of Gulf's Ella Lees 3, which was successfully completed for a new Cranfield outpost and is the only producer in Franklin.

Jeff Davis County: Humble's Denkmann Lumber Company B-1, C SE SE 27-9n-19w, Gwinville field, is testing below 8597 feet with no shows indicated. Chalk was marked at 7743 feet. In the same field Gulf located Vinnie Walker 1, NWc NE SW 34-9n-19w, an outpost test.

Jasper County: K. D. Owen & D. C. Bintliff of Houston are entering the oil play in East Heidelberg with a permit to drill B. A. Rowell 1, SW NW NE 13-1n-12e. Sun Oil Company's Eva Ross 1, NE SE SE 13-1n-12e, East Heidelberg, has been successfully completed with initial production of 260 barrels of oil per day. Casing was perforated at 4998-5019 feet and 5023-35 feet in the Eutaw horizon and swabbed in. In West Heidelberg Gulf's T. A. Myers Unit A 1, SWc 6-10n-10w, is preparing to test after reaching productive levels of the Eutaw horizon at 5000 feet.

Marion County: Humble's E. O. Ball 1, SWc 17-2n-14e, Hub field, is waiting on cement after running casing to 9130 feet. A drill-stem test at 9048-77 feet recovered water cushion and a good quantity of 52.7-gravity condensate. Cores from 9125-30 feet indicated oil sand at that level in the lower Tuscaloosa. Humble also has completed roads for E. A. Ball 2, SW SE 20-2n-14e, in this field.

☆ Alabama

Two Wells in Gilbertown Field Being Completed

Two Gilbertown wells completing; 2 wildcat failures dampen Alabama drilling hopes.

Choctaw County: The Carter Oil Company's Johnson Unit 1, SW SE NW 4-10n-3w, in the eastern extension of Gilbertown field, is running casing after entering the Eutaw at 3175 feet. Cores taken in that zone recovered sand with good stain. Carter's Sam Alman Unit 1, SW SE NE 5-10n-3w, in the same area, continues to have trouble with salt water. On initial production test it pumped 15 barrels of oil and 11 barrels of salt water per day. Total depth is 3370 feet.

Clarke County: Danciger Oil & Refining Company's State of Alabama 1, 21-5n-2e, which received extensive testing in the course of its development, has been abandoned at 4507 feet. Considerable salt water was recovered in the Massive sand zone topped at 3420 feet, and no shows were indicated at any point.

Mobile County: True Gauble's Boykin 1, NWc NE SE 25-2n-1e, has been abandoned at 7502 feet with no shows.

Danciger Oil & Refining Company's William R. Giesler 1, C NE SW 8-4s-2w, is drilling below 4425 feet.

Walker County: Glen D. Rose Oil & Gas Company's First National Bank of Birmingham 2, NW SE 30-12s-7w, is drilling below 1330 feet after setting casing to 1027 feet. J. H. Deason's De-Bardelaben 1, SE NW 6-14s-5w, remains shut down after reaching total depth of 1320 feet.

Wilcox County: Seaboard Oil Company of Delaware's S. M. McConnico 1, 32-12n-10e, wildcat, is drilling at 5017 feet with no shows. Top of the Tuscaloosa was logged at 1640 feet, the Massive sand at 2527 feet.

Florida

Humble Oil & Refining Company's deep wildcat, G. C. Carlton Estate 1, C SW NE 34-38s-29e, Highlands County, is drilling below 12,465 feet with no shows.

Calhoun County: The Pure Oil Company's International Paper Company 3, SEc 5-1s-10w, wildcat, is drilling below 2990 feet with no tests made to these depths.

Charlotte County: Humble's Lownes-Treadwell 1-A, wildcat in SW NE 17-42s-23e, is drilling below 12,450 feet in lime with no shows reported.

Monroe County: Gulf Refining Company's J. P. Scranton 1, 2-67s-29e, is at 715 feet in sand after setting 20-inch conductor pipe to 605 feet.

Lafayette County: Sun Oil Company's Crapps 1, C SW NE 25-6s-12e, is drilling at 240 feet.

Tennessee Map

The Division of Geology, Department of Conservation, State of Tennessee, Nashville, Tennessee, has published "Oil and Gas Investigation No. 2," a series of maps of various sections of the state, noting geologic divisions, columnar sections, etc. Copies may be had by writing Walter F. Pond, State Geologist, at Nashville.

☆ California

Test in Bandini Area Is Apparent Oil Discovery

Oil discovered by Richfield in Bandini area near Los Angeles; tests indicate possible discovery of new producing zone in old City field near downtown Los Angeles; fair showings noted in Del Valle extension test; another well completed at Cymric; duster in new Santiago field indicates limited extent of production; test of Stevens zone in Old River wildcat is disappointing.

Los Angeles County: Richfield Oil Corporation's test of Union Pacific Unit 1, Bandini area west of Santa Fe Springs oil field, indicates the discovery of a new field. Cleaned out 2 feet below the shoe of the 8⅝-inch casing cemented at 8561 feet, the well flowed 754 barrels of 32-gravity oil, 42 percent water. Sequel to the large water cut was the setting of a bridge plug at 8554 feet, preparatory to running a test on hole shots at approximately 8550 feet to determine whether the water is originating from back of the pipe or below. The well logged the first oil zone at approximately 7260 feet and entered the Miocene at about 7450 feet. A sixth sand was cored from 8390-8510 feet, then shale to 8558 feet, where a seventh zone was entered and cored to present bottom at 8608 feet.

Richfield's wells is in 9-2s-12w. Several weeks ago the company started a second test, Simons 1 in Sect. 15, now drilling below 5550 feet. Next well of interest to the Richfield discovery well, however, is C. G. Willis' Pansini 1 in Sect. 23, which has been standing with 7-inch casing cemented at 8195 feet, awaiting outcome of Richfield tests. Chanslor-Canfield Midway Oil Company is the third wildcatter in the area with Bandini 1 drilling in Sect. 21.

Seaboard Oil Company apparently has discovered a new producing zone in the old Los Angeles City field. It is Los Angeles Brick 1 in 21-1s-13w, a few blocks from downtown Los Angeles, in swabbing through perforations from 1710 to 1767 feet, is reported to have recovered 150 barrels of 20-gravity oil, with details not yet available. Well was drilled as a deep test. Total depth is 7505 feet with no production indicated on tests below the present plug.

Ventura County: Universal Consolidated Oil Company's westerly extension test of the Del Valle field, Aguirre 1 in 13-4n-18w, gave a fair account of itself on a test of the interval 2987-3049 feet. With tester open 3½ hours the recovery was 1700 feet of clean 21-gravity oil. Core recovery has been poor. Operator is running electric log after drilling to 3169 feet in shale.

Kern County: Union Oil Company has completed Anderson 35-26 in 26-29s-21e, Cymric field, flowing 341 barrels of 31.2-gravity oil through an 18/64-inch choke. Total depth is 3630 feet. Anderson 56-26 has declined to 27 barrels on the pump. Independent Exploration Company's second well at the north end of of the Cymric field, Cymric 1 in 21-29s-21e, is making hole at 3910 feet. Section is normal to present depth. Its deep sand discovery, Oceanic 1, had the top of the oil sand at 4657 feet.

Western Gulf Oil Company's I. M. Woodward 4, Santiago field, 22-11n-23w, has been abandoned. Drilled originally to 3328 feet, the well was redrilled to 3057 feet. With dips of 80 to 90 degrees it was evident from the outset that this field would be limited in size. Outcome of Richfield's Leutholtz A-3, also in Sect. 22, and The Texas Company's Western Minerals 2 in Sec. 21 will provide additional evidence of the extent of the field. Quality Oil Company will drill a test in Sect. 20, ¾-mile northwest of Western Gulf's discovery.

Shell's wildcat in the Old River area, K.C.L. 45-16 in 16-31s-26e, failed to show anything on a test of the Stevens zone between 10,588 and 10,631 feet. Recovery was muddy, oily water. Drilling is proceeding below 10,800 feet. Location is about 3 miles southeast of Shell's Ten Section field.

Another good well was completed from fractured Schist in the Edison field. Jergins Oil Company's McCowan 13A, S-1 in 13-30s-29e, was completed flowing 1050 barrels of 23.7-gravity oil through 40/64-inch choke.

Belridge Oil Company's deep test of the South Belridge field, 62-W-33, in 33-28s-21e, got under way and is drilling below 2950 feet.

Kings County: Standard Oil Company of California probably will abandon Cutter Unit 2, a test for gas in the Alpaugh area, 29-32s-22e. All sands tested were wet. Total depth is 4560 feet.

Standard is drilling in its wildcat on Kettleman Hills Middle Dome below 9135 feet in very hard shale.

Solano County: Shell has staked a wildcat gas test, McCune 1, in the Winters area, 29-8n-1e.

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Washington

Sharples Corporation has decided to pull out of the Grays Harbor area. After two years of wildcatting and expenditure of about $750,000, operations have been suspended. Several tests were drilled, one to 7000 feet. Leases embracing more than 30,000 acres will be returned to owners as they expire.

Gasoline Plant Planned

Warren Petroleum Company of Tulsa plans a $2 million repressuring and natural gasoline plant in the Hull and Silk pools of Archer County, Texas, approximately three miles south of Holliday.

☆ Illinois Basin

Mattoon Pool in Illinois Has Dry Gas Production

Mattoon pool, Illinois, test has 10 million cubic feet of gas daily; semi-wildcat nears completion; Phillips enters field; Uniontown pool, Kentucky, has new pay horizon.

Illinois

Booth and Absher's Craig 1, Mattoon pool, showed for 10 million cubic feet of dry gas daily when plug was drilled to test Cypress sand. Well is now shut in for connections and a decision by operators as to whether to complete the well as an oil or gas producer.

Meanwhile, a semi-wildcat well was nearing completion and 2 wildcats were waiting on cement to drill plug. Frank Hinkle's Myers 1, NW SE SE 15-12n-7e, on the west edge of the city of Mattoon, flowed 15 barrels per hour from Aux Vases sand and had not yet tested Cypress pay. Operators were preparing to place the well on pump.

Waiting on cement were E. P. Jarvis' Akers 1, a possible southeastern extension of the pool, and L. J. Brock's Conlin 1, northeastern extension test. Both wells have pipe set for Aux Vases sand tests.

Phillips Petroleum Company became the second major company to enter the field with a location for Tinlsye 1, SE SE NE 22-12n-7e, a pool well. The Texas Company is expected to make locations in the field within the next week.

Kentucky

The Uniontown pool has a new pay horizon and extension at Harry Ames' Girten 1, 16-P-20, Union County, ½-mile east of field production. Operator set casing at 2525 feet to test Aux Vases sand, which on a drill-stem test at 2528-41 feet made 100 feet of oil and no water.

Henderson County: Basin Drilling Company's Kasey Klub 1, 8-P-23, southwest edge of the city of Henderson, opened a pool when it swabbed 66 barrels of oil in 15 hours from McCloskey lime at 2440-50 feet. Operator is still testing.

☆ Michigan

Osceola County Test Swabs Oil from Monroe Dolomite

Osceola County test swabs oil after plugback; Ohio spuds deep test in Oscoda County; Sun abandons Wexford County test.

Osceola County: The Pure Oil Company swabbed 21 barrels of oil from Monroe dolomite at 3619-76 feet after plugback on Carr 1, NW NE SW 5-18n-10w, in the 1-well Ashton field. Test will be acidized later. It is a south offset to Pupher's discovery, 4 miles north of the Reed City field, which is producing from the Traverse at 2900 feet.

Oscoda County: The Ohio Oil Company, as unit operator, has started a deep test, 5000 feet or more in the 34,500-acre unit block taken in Oscoda and Ogemaw counties. All lands leased in the block are subject to a pooling and unit royalty and operation agreements. Lands are about equally divided in fee ownership between the state and federal governments and private ownership. It represents the first large-scale unit development operation in Michigan. Sohio Petroleum Company holds about the same amount of lease acreage in the unit as Ohio.

Wexford County: Sun Oil Company has abandoned Grubb 1, SW NE NE 21-21n-10w, wildcat 15 miles west of the Riverside gas field, after testing to 3923 feet. Only important oil show logged was in the Traverse lime between 3100 and 3140 feet but an attempt to acidize into production failed.

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Fig. D322

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☆Rocky Mountain Area

Park County, Wyoming, Test Opens New Horizon

Park County, Wyoming, test has new horizon; Weld County, Colorado, strike noted; Tide Water stakes wildcat in Morgan County.

Wyoming

Discovery of oil shows in the deep Deadwood formation, apparently in the Cambrian, opens a new horizon that has Rocky Mountain oil operators watching developments on the South Dome of Oregon Basin at the Pacific Western-Kirk 5 Connaghan-Govt., well SW SW SE 29-51n-100w, Park County.

Drillers are setting 5½-inch casing, preparatory to perforating and testing. The core showed saturation of light oil from 6337-6360 feet.

Green oil below the black oil now being produced from the Embar, Tensleep and Madison limestone suggests that Wyoming's black oil fields may overlay deposits of light oil. The Deadwood is considered very near the Granite. If a commercial well is completed it will lead to similar tests in the major oil pools now producing from stratigraphically shallower formations.

Colorado

Fred Manning & Associates 1, wildcat near Buckingham, in NE NE 15-7n-59w, Weld County, is reported to be an oil discovery. Total depth is 6649 feet, reported to have penetrated 29 feet into the Muddy, now being cored.

The Manning well is northeast of Denver not far from the Greasewood Flats field, once the most productive in Colorado. R. S. Shannon and associates are drilling a wildcat under the name of Colorado Unit Oil Corporation, at C NW NE 11-6n-61w. Across the line in Morgan County, a wildcat location has been announced by Tide Water Associated Oil Company. It is Well No. 7 in 30-5n-60w. A few miles south, at NW SW SW 1-3n-61w, The Ohio Oil Company-Associated No. 7-1, wildcat, is drilling at 6659 feet after setting whipstock at 6428 feet.

Opposes Federal Stand

Texas Attorney General Grover Sellers will attack efforts of the federal government to take over offshore lands at the annual conference of the National Association of Attorneys General which will meet in Jacksonville, Florida, December 4. Sellars has prepared a resolution which he will introduce putting the attorneys general on record in opposition to the federal move.

☆ Canada

Home-Brazeau Syndicate 1 Tests Porosity in Shale

Home-Brazeau Syndicate 1, Central Alberta Foothills wildcat which confirmed Madison limestone recently at 9498 feet and set 7-inch casing, drillstem tested 5 feet of slight porosity at 9525-9530 feet, obtaining ½ million to 1 million cubic feet of gas daily with strong petroleum order, no water. The test had passed from Madison back into Fernie shale at 9597 feet after drilling 99 feet of lime. Drilling continued at 9682 feet in Fernie.

Phillips Petroleum Company, Bartlesville, Oklahoma, has started its second Canadian wildcat. Like the first, it is located on the Sullivan Creek anticline in the South Alberta Foothills. Phillips-Sullivan Creek 2 will be drilled in 22-18-5w5, 2500 feet northeast of No. 1, abandoned in April at 2666 feet. Contractors Newell & Chandler are installing diesel-powered light rotary, with spudding slated early in December. Objective is the Madison limestone, looked for around 3000 feet. (No. 1 encountered Madison at 1832 feet, passed back into overturned Fernie at 1980 feet, Fernie in normal position at 2185 feet, and faulted again into the normally overlying Brown sand before abandoning at 2666 feet.) The No. 2 well is about 15 miles west of Turner Valley oil field.

The Irwin Millner interests of New York have staked their second test on the Vale Dome lease block on the Central Alberta Plains, secured from the Crown for a record cash bonus last June. The new test, Martin 2, has been staked in 1sd 12 9-42-6w4, ½-mile south and the same distance east of Martin 1, completed as a small gas discovery recently. No. 1 was on the crest of a seismographed Devonian dome. No. 2 is on the south flank, and will test the up-dip of lenticular sands assumed to be on the weathering product of the Devonian.

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EXPLORATORY COMPLETIONS

ALABAMA WILDCATS

Clarke County—Failure: Danciger's State of Alabama 1, 21-5n-2e, Chalk 1578 ft, Eutaw 2376 ft, Tuscaloosa 2560 ft, Massive sd 3238 ft, abnd 4507 ft.

Mobile County—Failure: True Cauble's Boykin 1, nwc ne se 25-2n-1e, Wilcox 3268 ft, abnd 7502 ft.

CALIFORNIA WILDCATS

Solano County—Failure: Honolulu Oil Corp.-Barnsdall's Liberty Farms 2, 15-5n-2e, Rio Vista area, abnd 5527 ft.

Kern County—Failures: U. S. Drlg. Co.'s Morris 2, 14-28s-20e, Belridge area, abnd 1196 ft.

Western Gulf Oil Co.'s I. M. Woodward-USL 4, 22-11n-23w, Santiago area, abnd 3328 ft.

Williams Bros. Oil Co.'s Layman 6, 12-28s-19e, Antelope Hills area, abnd 805 ft.

Ventura County—Failure: Union Oil Co.'s Simi 6, 17-3n-17w, Simi area, abnd 2920 ft.

Los Angeles County—Oil Discovery: Richfield Oil Corp.'s Union Pacific Unit 1, 9-2s-12w, Bandini area, elev 170 ft, Miocene 7450 ft, flow 754 bbls 32-gr oil, 42% wtr, td 8608 ft.

ILLINOIS WILDCATS

Clay County—Failure: Nation Oil Co.'s Owens 1, sw sw ne 3-4n-5e, abnd 2701 ft.

Coles County—Failures: George S. Engle's Hortenstein 1, sw ne se 5-12n-8e, abnd 2220 ft.

F. D. Walker et al's Sutton 3, sw nw se 36-14n-7e, abnd 1925 ft.

Jefferson County — Failure: John Darlan's C.B.&RR 1, sw nw ne 21-1s-1e, abnd 2413 ft.

Jefferson County—Oil Discovery: Gulf Oil's Purcell 1, nw sw se 4-3s-4e, Aux Vases 2913-54 ft, pump 27 bbls, td 3166 ft.

Jersey County—Failure: Ed Gieck et al's Goodin 1, sw ne se 22-7n-11w, abnd 1005 ft.

White County—Oil Discovery: Globe O&R's Organ 1, nw nw ne 35-4s-9e, Tar Springs 2598-2611 ft, pump 33 bbls, td 3379 ft.

INDIANA WILDCATS

Gibson County—Oil Discovery: Deep Vein Coal Co.'s Fee 1, ne ne se 1-2s-12w, Ben 2124-38 ft, pump 155 bbls, td 2138 ft.

Gibson County—Failure: R. E. Johnson's Clayton 1, ne nw nw 4-2s-12w, abnd 2578 ft.

Pike County—Failure: Bedford Dev. Corp.'s Schmidt 1, sw sw se 18-1n-8w, abnd 1500 ft.

Rippley County—Gas Discovery: A. Seevers et al's Schulenburg 1, ne sw sw 11-6n-12e, Trenton 380-85 ft, flow 25,000 gas, td 620 ft.

KANSAS WILDCATS

Barton County — Failure: Republic Nat.'s Harmison 1, nec 5-19s-13w, Cong 3394 ft, abnd 3451 ft.

Butler County — Failure: G. L. Ramsey's Ramsey 1, ne nw sw 22-24s-5e, Kansas City 2175 ft, abnd 2810 ft.

Cowley County — Failure: Tom Palmer's Kittleson 1, nw sw sw 12-32s-3e, Arb 3414 ft, abnd 3435 ft.

Dickinson County—Failure: P. M. Polhamus' Lefert 1, ne ne sw 1-11s-3e, Arb 2932 ft, abnd 2980 ft.

Ellis County—Failures: Volcanic Oil Co.'s Gorrill 1, se se ne 26-12s-18e, Wilcox 2030 ft, abnd 2146 ft.

Phil Han's Raynesford 1, swc 17-13s-20w, Arb 2897 ft, abnd 3930 ft.

Eldorado et al's Rankin 1, nec 33-13s-20w, Arb 3918 ft, abnd 3950 ft.

Franklin County—Failure: Brundrid Oil Co.'s Tar Supply Co. 1, se se ne 36-16s-21e, abnd 1700 ft.

Harvey County — Failure: Harbar et al's Strausz 1, swc ne 6-22s-2w, Arb 3777 ft, abnd 3802 ft.

Pawnee County—Oil Discovery: Huber et al's Katchelman 1, nec 34-22s-16w, Arb 4059-4064 ft, swab 96 bbls, td 4064 ft.

Rooks County—Failure: Skelly's Sutor 1, ne ne sw 24-10s-20w, Arb 3769 ft, abnd 3799 ft.

Stafford County—Failure: Sohio's Richardson 1, ne ne se 19-24s-11w, Arb 4059 ft, abnd 4095 ft.

KENTUCKY WILDCATS

Henderson County—Failure: W. F. Bilsky et al's Royster 1, 13-O-23, abnd 2785 ft.

Union County — Failure: Ernest Eslick's Vaughn 1, 18-P-19, abnd 2855 ft.

NORTH LOUISIANA WILDCATS

Madison Parish—Failures: Sohio's W. L. Etheridge 1, elev 89 ft, Wilcox 2902 ft, Midway 5225 ft, Clayton 5800 ft, Tuscaloosa 6875 ft, Paluxy 7760 ft, abnd 8024 ft.

Murphy and Sun's H. W. Lee et al 1, 8-17n-12e, abnd 6603 ft.

West Carroll Parish—Failure: Calif. Co.'s J. E. Hill 1, 2-19n-9e, elev 102 ft, gas rock 2664 ft, abnd 7337 ft.

SOUTH LOUISIANA WILDCAT

Calcasieu Parish—Oil Discovery: Union Sulphur Co.'s Bordages 1, 3388.2 n 1800.1 e of swc se¼ 5-10s-9w, pay 8478 ft, perf 60 shots 8480-90 ft, flow 60.72 bbls, 13/64-in, gor 23,476/1, tp 2200 lbs, td 8616 ft.

MICHIGAN WILDCATS

Allegan County—Failures: S. L. Findley's Kaylor 1, sw sw sw 1-1n-14w, abnd 1398 ft.

Oil Producers' Scott 1, ne sw sw 6-1n-15w, abnd 1230 ft.

Van Buren County—Failure: Smith and McGerry's Kalisiak 1, ne ne sw 21-1s-13w, abnd 1365 ft.

Washtenaw County—Failure: C. W. Collin's Whittiker 1, ne sw sw 20-2s-3e, abnd 2027 ft.

Wexford County—Failure: Sun's Grubb 1, sw ne ne 21-21n-10w, Dundee 3756 ft, abnd 3923 ft.

MISSISSIPPI WILDCAT

Hinds County—Failure: Carter's Simmons C-134 1, nwc se nw 29-4n-3w, Wilcox 3020 ft, Eutaw 7490 ft, Tuscaloosa 8843 ft, Massive sd 8956 ft, abnd 9056 ft.

MISSOURI WILDCATS

Atchison County—Failure: Dan Short's Tarkio College 1, se sw ne 16-65n-41w, abnd 1410 ft.

Harrison County—Failure: Dan McLaughlin et al's Johnson 1, se of sw 14-65n-21w, abnd 1690 ft.

Platt County—Failure: Fox's Fee 1, sec sw 12-51n-35w, Marmaton 640 ft, abnd 690 ft.

Putnam County—Failure: Dan McLaughlin et al's Johnson 1, se sw 14-65n-21w, Decorah 1655 ft, abnd 1690 ft.

NEW MEXICO WILDCATS

Santa Fe County—Failures: Richfield Oil Corp.'s Lee 2, 330 fr sl 1530 fr wl, sw se sw 14-14n-11e, abnd in Pre-Cambrian Schist 2725 ft.

Richfield's Federal Lee 1, c nw nw 25-14n-11e, abnd in granite 2588 ft.

OKLAHOMA WILDCATS

Carter County — Failure: Geo. Stagnor's Brady 1, ne sw sw 32-1s-2w, abnd 2761 ft.

Grady County—Failure: Phillips' Duke 1, sw sw se 25-5n-8w, abnd 10,708 ft.

Johnston County—Failure: Mid-Continent's Bates 1, ne sw 28-4s-6e, abnd 1854 ft.

Lincoln County — Failure: L. B. Jackson's Gage 1, sw se se 30-14n-5e, abnd 4885 ft.

Noble County—Failure: Ohio Oil's Hubbartt 1, nw sw se 18-20n-1w, Marshall 5176 ft, abnd 5232 ft.

WEST TEXAS WILDCATS

Crane County — Gas Discovery: Gulf's U. Henderson Estate 1-E, sect 25, blk B-27, PSL, flow 840,000,000 gas, 2-in tubing, td 6625 ft, pb 4409 ft.

Upton County—Failure: Cole, Gruber & Coburn-Superior's J. D. Starnes 1, sect 1, blk 3 GC&SF sur, abnd 1870 ft.

WEST CENTRAL TEXAS WILDCATS

Coleman County—Failure: Hightower O&R Co.'s W. M. Riley, Jr. 1, J. S. Martin sur, abnd 1531 ft.

Haskell County—Failure: Manning & Brown's F. A. Adair 1, abnd 3335 ft.

Jones County—Oil Discovery: Eastland Oil Co.'s W. L. Chittenden 1, sbdn 19, Louis Kratz sur, perf 3020-36 ft lime, pump 69 bbls, 2-in tubing, td 3036 ft.

SOUTH CENTRAL TEXAS WILDCATS

Dimmett County—Gas Discovery: Humble's H. S. Davis 1, 660 fr nw&swl lot 6, blk 1, on 534.51-ac lse T&NO sur 15, perf 42 shots 2710-17 ft, flow 5,750,000 gas, tp 1130 lbs, td 7550 ft.

Milam County—Failure: Glenn & Harding's J. S. Jacobs 2, 1500 fr swl 330 fr sel 50-ac lse, Jose Real sur, swabbed a little oil, abnd 1130 ft.

SOUTHWEST TEXAS WILDCATS

Duval County—Failure: Raymond D. Reynolds' Flory D. Lowe 1, 990 fr el 966 fr sl 640-ac lse and J. G. Lowe sect 74, abnd 3406 ft.

Starr County — Failure: W. L. Goldston's Roos & Bennett 2, 1263 fr el 2100-ac lse 4000 sw of well 1 (gas), Porc 93, sh 100, abnd 4726 ft.

Webb County—Failure: O. W. Killam's L. R. Ortiz 2, 330 fr s&wl sur 2026, 4000-ac lse Porc 26, abnd 5155 ft.

Zapata County—Echols Gas Discovery: Geo. H. Echols' T. Dominguez 1, 660 sw of nel 660 se of nel 401-ac lse, Porc 31, sh A, perf 72 shots 1948-68 ft, flow gas, no gge, shut in, td 2242 ft.

LOWER TEXAS COAST WILDCATS

Bee County—Failures: Smith, Story-Wood Corp.'s Nat. Bank of Comm. 1, 660 fr ne&nwl of sbdn 36, Wangemann Rch, abnd 5516 ft.

G. W. Strake et al's Mrs. E. L. McKinney

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■ WANTED: By The Superior Oil Company, young men with college background in geology. Single men preferred. Write P. O. Box 96, Bakersfield, California. Apply 1425 Union Avenue, Bakersfield, California.

■ WANTED: By The Superior Oil Company, young men with college background in electronics. Single men preferred. Write P. O. Box 96, Bakersfield, California. Apply 1425 Union Avenue, Bakersfield, California.

■ Exceptional opportunity for right man. Large Manufacturer Heat Transfer Equipment catering to refineries and chemical plants desires services of Sales Engineer for coastal and North Texas territories. Must be familiar with heat transfer applications and have wide acquaintance with refinery personnel. Salary, expenses and commission override. First letter should include all qualifications and background and a small photograph. Address: Box 66, c/o The Oil Weekly, Houston, Texas.

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■ WANTED: By large southwestern. electric utility company, young engineer who has had some oil field production experience. ME or EE graduate preferred. Work involves promotion and application of electricity in oil fields; also some testing. Give full details as to age, training, experience, salary expected, etc. Address: Box 71, c/o The Oil Weekly, Houston, Texas.

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■ Petroleum Geologist, Master Science, 26, married, wants general geologic work, Mid-Continent area. No experience, except Navy executive and engineer. Address: Box 61, c/o The Oil Weekly, Houston, Texas.

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■ WANTED TO BUY: One 3-inch tubular leg derrick 72 to 87 feet high. Near Houston. Address: Box 58, c/o The Oil Weekly, Houston, Texas.

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■ Honorably discharged, commercial airline pilot desires permanent employment with oil company. Commercial license, instrument rating, multi-engine rating, flight instructor's rating, radiotelephone license, 1400 hours civil, 1100 military. Experience on all types of aircraft. Age 29. Mark Higgins, Wilson, Box 283, Somerville, Texas.

■ Geophysicist-geologist, 5½ years experience in gravity, magnetic, seismic prospecting, holding positions to and including party chief, M.S. in geology, age 32, married, prefers work in U. S. or Canada. Available about February 15, 1946. Lt. Julian Hawes, 2618 S. Wayne St., Arlington, Va.

et al 1, 467 fr n&wl 1489-ac lse, L. C. Randolph sur, E. Tuleta area, abnd 8310 ft.

Calhoun County—Oil Discovery: Quintana Pet. Corp.'s W. A. Shofner Est. 1, 1875 fr nwl 330 fr swl 730-ac lse, Bonifacio Rodriguez Lge, 3400 ne of Boyd 1, pay 5710 ft, perf 117 shots 5710-25 ft, flow 74.25 bbls 37.3-gr, ⅛-in, gor 835/1, tp 590 lbs, cp 730 lbs, td 8613 ft, pb 5869 ft.

Kleberg County—Failure: Humble's D. J. Sullivan 1-D, 660 fr n&wl A&NW sur 19, 8097.35-ac lse, abnd 9242 ft.

San Patricio County—Failure: Coastal Refg. Co.-Henshaw Bros.' Luling Foundation 1, 330 fr s&el sect 50 and 153-ac lse, Cubage & Miller sbdn O'Connor pstr, abnd 6326 ft.

Victoria County—Gas Discovery: Taylor Ref.'s Raymond F. Meyer 1, 660 fr nw&swl 202-ac lse and blk 48, Andrew Peets sur, perf 22 shots 4720-26 ft, flow gas, no gge, tp 1750 lbs, shut in td 5705 ft.

UPPER TEXAS COAST WILDCATS

Ft. Bend County—Failure: Pure's R. F. Ransom 1, 495 fr n&wl 44.6-ac part of 179.2-ac lse, 1075 w of el Wm. Andrus Lge, 2 mi n Rosenberg, elev 87½ ft, abnd 8628 ft.

Liberty County—Failure: R. Olsen Oil Co.'s J. F. Richardson 1, 330 fr s&wl 136.4-ac lse on Richardson fee lands, John Page sur, elev 60 ft, abnd 8014 ft.

Newton County—South Call Distillate Discovery: Humble's E. C. Hankamer et al 1, 660 n of sec sect 23 alg wl J. B. Smyth sur 330 e at ra on 340-ac tr out of 42,210-ac lse, pay 9958 ft, perf 38 shots 7960-66 ft, flow 80 bbls 62-gr, 11/64-in, gor 14,162/1, tp 2575 lbs, td 9009 ft.

EAST TEXAS BORDER WILDCATS

Harrison County—Failure: Stanolind's Hattie Cole 1, 56-ac tr, Chas. Taylor sur, Roseborough Springs area, elev 318 ft, show gas-cut mud dst 5635-57 ft, abnd 6800 ft.

Marion County—Failure: Texona Prod. Co.'s Turner-Hicky 1, Robt. Potter sur, abnd 2860 ft.

EAST TEXAS WILDCATS

Cherokee County—Failure: Allied Oil Co.'s Mrs. Ruth Franks 1, 3½ mi ne Alto, Helena Kimble sur, Woodbine test, abnd with sli sh gas 5412 ft.

Freestone County—Failure: W. C. Curry's O. Burleson 1, 2 mi sw Streetman, James Sparks sur, 483 fr nl 903 fr e&wl 80-ac tr, abnd 3510 ft.

Henderson County—Failure: Delta Drlg. Co. et al's Hurt & Miller 1, 2 mi ne Poyner, Isaac Robert sur, elev 573 ft, abnd 5245 ft.

EAST TEXAS NEW PAY TEST

Wood County—Quitman Shallow Oil Discovery: Shell's Harris-Atlatl 1, 760 nsl 2115 ewl of E. Goodsir sur, offset 6200-ft Paluxy, elev 402 ft, Paluxy series 6251 ft, pump 62 bbls fr Sub-Clarksville perf 4126-40 ft, td 6700 ft, pb 4201 ft.

NORTH TEXAS WILDCAT

Young County — Failure: Panhandle Ref. Co.'s Maud Graham 1, D. Pruitt sur, abnd 4673 ft.

WESTERN CANADA WILDCATS

Alberta Foothills Belt—Jumping Pond Failure: Shell of Canada's No. 10-14-J, lsd 10 14-25-5w5th, Madison lime 10,639 ft, abnd 10,959 ft.

South Alberta Plains — Burdette Failure: California-Standard's Burdette-Province 2, lsd 1 10-8-11w4th, sso and wtr in Ellis sand; abnd in top of Madison 3211 ft.

Conrad—Failure: California-Standard's Conrad-Province 73-33B, lsd 5 33-5-15w4th, so in Ellis not commercial, abnd in top of Madison 3119 ft.

Grassy Lake—Failure: Imperial Oil's Grassy Lake 3, lsd 2 35-10-13w4th, abnd in Cambrian 6400 ft.

Princess—Gas Discovery: California-Standard's Princess-CPR 16-22A, lsd 9 22-20-12w4th, 7-inch casing set 4067 ft, big gas flow in top of Devonian Dolomite at base of casing, td 5018 ft, pb 4074 ft.

WILDCAT STARTS

ARKANSAS

Logan County: Ark.-La. Gas Co.'s N. C. Biggs 1, s ne nw 7-7n-27w, dr 990 ft.

Independence County: Rosie Hill Oil Co.'s Wyatt 1, 16-12n-5w, lcn.

CALIFORNIA

Kern County: Independent Exploration Co.'s Richardson 1, 18-29s-21e, Gould Hills area, lcn.

Quality Oil Co.'s L-1, 20-11n-23w, Santiago area, lcn.

Williams Bros. Oil Co.'s Layman 4, 7-28s-20e, Antelope Hills area, rur.

Solano County: Shell's McCune 1, 29-8n-1e, Winters area, lcn.

COLORADO

El Paso County: Colorado Pet. et al's No. 1, nw sw 17-17s-67w, 4 mi nw of Conoco test, Sullivan Park Dome, lcn.

Morgan County: Tide Water's No. 7, 30-5n-60w, se of R. S. Shannon deep test in Greasewood Flats area, lcn.

Kiowa County: Union Oil Co.'s U. P. No. 1, 17-17s-48w, (near Eads), lcn.

ILLINOIS

Coles County: Geo. S. Engle et al's H. J. & Jesse Groniger 1, sw sw sw 7-12n-8e, dr.

Ben H. Nation's Clark 1-A, ne sw nw 32-12n-8e, dr.

A. Y. Bradley et al's Cramer 1, se se se 35-13n-7e, lcn.

Madison County: Sohio's Conrad 1, ne ne nw 29-5n-6w, dr.

Saline County: B. A. Baker's Holbrook Hrs. 1, sw nw ne 13-9s-7e, dr.

Washington County: Ryan Oil Co.'s Poiret 1, se nw nw 14-2s-2w, lcn.

White County: Ryan Oil Co.'s Higginson Hrs. 1, ne nw ne 22-4s-10e, lcn.

KANSAS

Barber County: Continental et al's Skinner 1, se se ne 33-31s-15w, lcn.

Graham County: Royer & Farris' Holland 1, nwc 25-8s-22w, lcn.

Gray County: E. F. Wakefield et al's Brubaker 1, se nw se 18-24s-28w, mirt.

Rooks County: Phillips' Zeigler 1, se ne se 8-9s-19w, dr.

Stafford County: Willis Hartman et al's Anschultz 1, se se nw 11-21s-14w, mirt.

NORTH LOUISIANA

Concordia Parish: S. W. Richardson's Madison Oil & Dev. Co. 1, 16-6n-8e, lcn.

S. W. Richardson's Madison O&D Co. A-1, 16-6n-8e, lcn.

SOUTH LOUISIANA

Assumption Parish: Continental's Whitecastle Lbr. & Shgl. Co. 1, 330 n&w of sec 28-12s-13e, 1 mi n Napoleonville prod, 12,000-ft test.

Calcasieu Parish: Max Pray's Eliz. Yust 2, 330 s 660 w of nec 28-10s-12w, 330 w of jnkd hole, Hackberry test.

Lafayette Parish: Raymon & Cockburn's Lafayette Parish School Board 1, 660 n 666.3 e of swc 16-11s-5e, 7500-ft test.

St. Mary Parish: Humble's J. M. Burguieres Co. et al 1, 22-15s-7e, Cote Blanche Island area, 8000-ft test.

MICHIGAN

Gratiot County: Gordon-Sohio's Roberts 1, se sw se 13-9n-3w, lcn.

Oscoda County: Ohio Oil Co.'s Mio Unit 1, se nw sw 30-25n-3e, dr.

Ottawa County: P. K. Degenther's Starken 1, ne sw nw 8-6n-13w, lcn.

Van Buren County: W. D. Gannett's Keefe 1, sw sw se 17-1s-15w, lcn.

S. L. Godfrey's Koselink 1, nw nw ne 30-3s-15w, dr.

MISSISSIPPI

Madison County: Carter's Griffin C-138 1, ne nw 25-11n-3e, lcn.

Adams County: Humble's Adams City Board of Supervisors 1, sec 47-6n-1w, lcn.

MISSOURI

Caldwell County: O. R. Newcomer's Zeikle 1, c sw nw 27-55n-29w, dr 355 ft.

Todd & Tuering's Benson 1, nw ne nw 30-55n-29w, dr 60 ft.

NEBRASKA

Washington County: Bay Harrop et al's Juckiness 1, c sw¼ 12-19n-11e, dr 150 ft.

NEW MEXICO

Lea County: Mid-Continent's A. L. Christmas 1, 1980 fr s&el 17-22s-37e, 8500-ft Ellenburger test.

OKLAHOMA

Cotton County: T. H. McCasland-Texon Oil's Yer-nit-cut 1, se se ne 11-3s-12w, bldg dk.

Creek County: Bay Pet. Co.'s Fee 1-A, dr 725 ft.

WEST TEXAS

Dawson County: Seaboard's S. E. Lee 1, 660 fr n&el sect 47, blk 34, 5-N, T&P sur, lcn.

WEST CENTRAL TEXAS

Taylor County: Crown Central Pet. Corp.'s J. F. Douglas 1, 1700 fr sl & 330 fr wl sect 14, Grimes CSL sur 147, dr.

SOUTHWEST TEXAS

Duval County: Don Marsh et al's Dolores Garcia 1, 660 fr nwl 2750 fr nel 592.8-ac tr, sh 4, Santa Cruz de Concepcion Gr, 1½ mi e of Sejita fld, 6500-ft test.

Sid Katz' W. R. Peters 1, 330 fr nl 1806.5 fr el sur 40, 1000-ac lse, 2750-ft test.

Starr County: Mission O&G Co.'s Starr County Ld. & Cattle Co. 1, 330 e of wl 660 n of sl lot 62 of Jeffries-Lambeth sbdn of n 3000 acs of sh 60-0 Porc 89, on 500-ac tr, 2800-ft test.

LOWER TEXAS COAST

Jackson County: Crown Central Pet. Corp.'s Lucille Hensley Seale 1, 660 fr el 1320 fr sl 748.47-ac lse, Josiah H. Bell sur, 8500-ft test.

Wirt Franklin Pet. Corp.'s I. B. Clements 1, 3016 w of rd 466 s of nl 200-ac lse, T. H. P. Heard Lge, 1 mi ne Cordele fld, 2900-ft Catahoula test.

Karnes County: W. E. Kinnear's J. R. C. McCougal et ux 1, 844 w of sec Wm. Taylor sur 2200 s of nl of Leckie sur, 353.5-ac lse, 7200-ft test.

Refugio County: Pan Oil Co.'s Haertig 1, 330 fr n&el 2½ se¼ sect 6, Johnson & Pugh sbdn Bonnie View Rch, e of Larosa fld, digging pits.

UPPER TEXAS COAST

Chambers County: Sun's Franklin 1, 660 fr n&el H. Barker sur, ne Smith Point, lcn.

Polk County: Brooks & Lively's De La Cattle Co. 1, 660 fr w&sl blk 29, R. Lynch sur, dr 1683 ft in shale.

EAST TEXAS

Henderson County: Sohio's Bella M. Mandelstan 1, 3 mi e and n of Poyner, 330 fr wl 330 fr nl 320-ac tr, G. W. Baker sur, Woodbine test, mim.

Houston County: Fred M. Manning's Houston Lumber Co. 1, 4 mi se of Weches, 400 fr sel 870 fr swl of P. Mirando sur, Woodbine test, mim.

NORTH TEXAS

Archer County: Benson Bros. et al's L. F. Wilson-McCrory 1, 1000 ewl 1200 snl sect 99, ATNCL sur, 1800-ft rotary test.

Cooke County: S. W. Petre et al's J. Raiser 1, 330 fr m/s/sl 1270 fr m/e/el of M. Trevino sur A-1021, 2500-ft test, dr 1200 ft.

Sun's Dora L. Midkiff 1, 346 fr el 467 fr sl Soloman Gann sur, 9500-ft rotary test.

J. R. Meredith's E. L. Miller 1, 1500 fr sl 330 fr wl, 150-ac tr C. W. Hawkins sur, 2500-ft rotary test.

Grayson County: Standard of Tex.'s A. G. Mitchell 1, 960 fr swl 680 fr nwl 83.17-ac tr, or 2640 snl 4550 ewl of J. B. McAnair sur A-763, nw of Sherman, mim for 12,000-ft Ellenburger test.

Jack County: Panhandle Ref. Co.'s T. H. Cherryhomes B-1, 467 fr nl 1264 fr wl of 226.5-ac of s 453-ac of Cherryhomes land, Jas. Hughes sur, 6200-ft rotary test.

Lesco Inc.'s S. F. Vanhoose 4, 330 fr n&wl blk 1, BS&F sur, 4000-ft rotary test.

Paul Brisco & Ferguson's A. D. Willis 1, 450 fr nl 1350 fr wl m/wly/nwc Willis 122-ac tr in George H. Duncan sur, 1200-ft rotary test.

Montague County: Continental's Geo. Jarrell 1, 67 nsl 1400 wel sect 3433, TE&L Co. sur, 6900-ft Ellenburger test.

Nu Enamel Oil Op. Co.'s W. L. Admire Estate 1, 330 fr s&wl G. W. Fisher sur, 6700-ft rotary test.

Fred M. Manning et al's D. W. S-1, 330 fr s&wl lot 184, J. P. Owenby sur, 7200-ft rotary test.

Throckmorton County: A. R. Dillard et al's W. R. Mathews 1, sw se nw E.T. Ry. 236, blk 10, 2000-ft test.

Wichita County: Akin-Dimock et al's Roy E. Gibson 1-A, 990 out nwc blk 271, Waggoner Colony Lands, 5000-ft Ellenburger test.

Wilbarger County: Amerada's E. A. Judd 1, 2310 snl 1320 wel H&TC Ry. 59, blk 15, 3¼ mi e by n of Fargo fld, 5500-ft Ellenburger test.

WYOMING

Carbon County: Ohio Oil's Harrison & Cooper 10, se se ne 3-19n-78w, Rock River area, wort 160 ft.

Hot Springs County: Ohio's Washakie 8 OPC Well 5, ne 18-46n-98w, Grass Creek area, dr 1611 ft.

Washakie County: G. & G. Oil Co.'s Neibur 1, lot 8, 19-45n-92w, Tensleep test, may go to 11,500 ft.

WESTERN CANADA

Alberta Foothills Belt—Sullivan Creek: Phillips' Sullivan Creek 2, 22-18-5w5th, 2500 ft ne fr Phillips' 1, ru.

Central Alberta Plains—Vale Dome: Erwin Milliner et al's Martin 2, lsd 12 9-42-6w4th, lcn.

Kinsella: Imperial Oil's Kinsella 2, deep structure test, lsd 11 20-48-9w4th, elev 2370 ft, lcn.

Imperial Oil's Kinsella 3, deep structure test, lsd 7 6-49-9w4th, elev 2400 ft, lcn.

Sunray to Give Bonuses

Sunray Oil Corporation, Tulsa, Oklahoma, will distribute an employe bonus of 5 percent of the year's salary as a share in company earnings to regular employes of December 15, according to a letter addressed to employes by President C. H. Wright.

SQUEAKS from the BULL WHEEL

Evading the Issue

Dean: "Are you writing that letter to a man?"

Coed: "It's to a former room-mate of mine."

Dean: "Answer my question!"

Cautious Cutie

"Why wait 'til we get home to tell me whether you'll marry me?"

"I'm scared. This is the very spot where my father proposed to my mother."

"Well?"

"She said yes and on the way home the horse ran away and father was killed."

Time Cures All

"It's a girl, Sultan."

"Tarnation! I wanted a boy."

"Be patient, Your Highness. There will be three more this afternoon."

Revelation

Her dress was tight
She scarce could breathe
She sneezed aloud
And there stood Eve.

Pretty Kitty

"That's a prety dress."

"Yes, I only wear it to teas."

"Whom?"

Recipe

"Oh, I'd love to go to a fraternity dance."

"Well, that's the way to get there, babe."

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Form 267—Pipe Tally—50 duplicate sets to book, size 4¼ x 8½

Form 280—Daily Drilling Report—33 triplicate sets to book, size 5½ x 8½

Form 282—Three Tour Drilling Report with Pipe Tally, size 8½ x 11—33 triplicate drilling sets, 10 duplicate pipe Tally sets to book

Form 290—Pipe Line Run Tickets—33 triplicate sets to book, size 4½ x 7½

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This Curious World

The scarcity of men has made many a girl good and lonely.

Many women dress to kill—and cook the same way.

She's the kind of a girl who whispers sweet nothin' doin's in your ear.

"I'm fed up on that," cried the baby, pointing to his high chair.

Inscription on a tombstone: "Here lies an atheist—all dressed up and no place to go."

She was just a second-hand dealer's daughter and that's why she wouldn't allow much on the old sofa.

The best way to ruin a smooth-running organization is to throw a wench in the machinery.

The girl who does everything under the sun always has shadows under her eyes.

Papa Gnu came home from work and Mama Gnu rushed up and told him shyly: "I've got Gnus for you!"

He who laughs last is probably an Englishman.

She was only a lamplighter's daughter, but the things she did in the dark!

Sailor's Lament

You can always tell a seaman
by his looks of great alarm;
You can tell a petty officer
by the crow upon his arm;
You can always tell a captain
by his scrambled eggs and such;
You can always tell an ensign
—But you can't tell him much.

Too Much Competition

Sarge: "I suppose when you get out of the Army you'll be waiting for me to die so you can spit on my grave."

Rookie: "No, Sarge. After I shed this uniform, I never want to stand in line again."

Fertile Speaker

Toastmaster, introducing the speaker: "I'm sure that Mr. Jones, of the Soils and Fertilizer Department, will give us a pleasant half hour. He's just full of his subject."

Pretty Cover

"It's time for closing, sir," said the librarian. "Is there anything you'd like to take out?"

"Yes, there is. How about your assistant in the blue dress?"

Poet's Nook

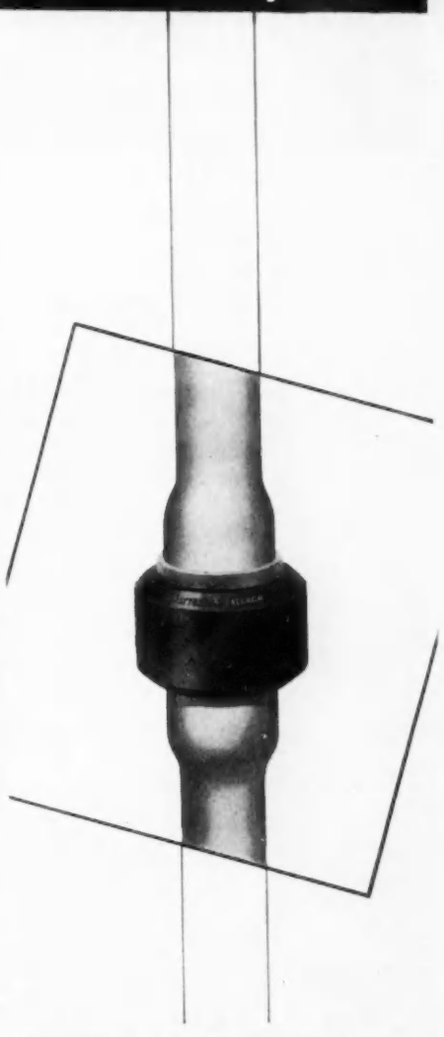
It makes a woman quite upset
To lose her youthful silhouette.

Encore

"May I print a kiss upon your lips?" he asked.

She nodded sweet permission.
They went to press, and I guess,
They printed a large edition.

"Best Bet Yet"



Cut Metal-to-Metal Contact

These oil-proof, insulating, wear-resistant, plastic tubing protectors are an integral part of the tubing collar. Made in all sizes, they prevent the metal-to-metal contact that causes many expensive "wet" jobs in pumping wells. Without this contact, the collars do not wear holes in the casing.

See Composite Catalog

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The ease of operation and quick opening—2½ to 4 turns—of the ORBIT Drilling Valve has made it the number one choice of men in the field. Its dependability and ability to give a positive seat under the severest conditions have made it a must—for safety.

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See pages 2194 to 2211 in 1944 Composite Catalog

ORBIT VALVE COMPANY
TULSA, OKLAHOMA

MEN IN THE INDUSTRY NEWS

Tom Buras has been named purchasing agent for Kerlyn Oil Company at Oklahoma City. He formerly was purchasing agent for Northern Ordnance, Inc., and later for Bethlehem Supply Company at Shreveport.

Jack Abernathy has resigned from the production department of Sunray Oil Corporation at Tulsa to become assistant to **W. T. Payne,** president of the Big Chief Drilling Company at Oklahoma City.

G. C. Richardson has resumed his duties as superintendent of the motor transport department of the Southwest division, The Pure Oil Company, Tulsa, following his discharge from the Army Air Corps with the rank of major.

Franklin Courtney Ellis, formerly head of the public information department for Eastman Kodak, has joined the public relations staff of Standard Oil Company (Indiana) as assistant director. Ellis served with the Philadelphia Public Ledger, Springfield (Mass.) Republican, New York Evening Post, and the Outlook.

Standard also has appointed **John Canning** its press representative in recognition of achievements in ten years as an assistant in public relations.

Capt. Harry C. Lane has been released from the Army and rejoined the First National Bank and Trust Company, Tulsa, in the correspondent bank division. Captain Lane served in the European theater and was awarded the Bronze Star and the Purple Heart.

Dr. E. H. Sellards, geologist with the University of Texas, has been honored with a commendatory scroll by the Houston Geological Society. He was recognized "for his outstanding ability and conscientious efforts in the field of geology; his skill in organization and administration; and his generous guidance and advice to geologists for a lifetime."

W. A. Robinson has been appointed superintendent of gasoline plants in the West Texas area, for Lone Star Gas Company.

George W. Stevens has returned to the Superior Engine Division of The National Supply Company after 3½ years with the Navy, from which he was discharged with the rank of lieutenant commander.

He will be located at Fort Worth, and has been appointed regional manager the same position he held prior to entering the service.

George W. Stevens

George Blair, for many years an officer of National Foam System, Philadelphia, has returned from the Navy to his civilian position as vice president of the company. Commander Blair was on active duty with the Navy for three years. He served in Naval Aviation during World War I and, in the last war, developed a simplified signal projector, and was instrumental in developing many improvements in fire extinguishing foams.

George Blair

G. S. Myers has been appointed a member of the chemical engineering staff of Eshelman & Potter, combustion and chemical engineers, of Birmingham, Alabama, and Charlotte, North Carolina.

Donald C. O'Hara, recently released from the Army with the rank of lieutenant colonel, has joined the staff of the National Petroleum Association and will be stationed in Washington, D. C. His duties will be in the field of industrial relations.

Howard C. Pyle, vice president of the Bank of America, Los Angeles, spoke before the Nomads Club of Tulsa and the Mid-Continent Section, American Institute of Mining and Metallurgical Engineers, November 29, on "Providing Oil for the Armies of Europe." Pyle was on the staff of General Eisenhower and was formerly chief production engineer for Union Oil Company of California.

Edward J. Brook has been appointed assistant to **President W. D. Waltman** of the Franco-Western Oil Company, Los Angeles.

James A. Hall has been named district petroleum engineer for the Oil and Gas Division of the Texas Railroad Commission to serve in the Midland, Texas, office. He was released recently from the Army, having served since 1940. Hall was graduated from Texas A. & M. College in 1937 and was employed by the Commission until he went into the Army. He formerly served in the Houston district office of the Railroad Commission.

Ted R. Spurling has been appointed superintendent of Lone Star Gas Company's plant at Trinidad, Texas. He has been superintendent of Lone Star's cycling plant at Grapeland.

Dr. Chester R. Longwell, chairman of the department of geology, Yale University, spoke before the West Texas Geological Society at Midland, Texas, on "Geology of the Basin Ranges—Revelations and Problems."

A. R. Hauser has succeeded the late **John McClain** as joint district manager of Clark Brothers Company, Inc., and Pacific Pumps, Inc. Chicago offices.

Hauser has had ten years of engineering service in the engineering department of Pacific Pumps, Inc. of Huntington Park, California. During his last three years with Pacific Pumps he was assistant Chief Engineer. Hauser is a graduate of Chicago Technical College.

A. R. Hauser

William T. Nightingale, Rock Springs, Wyoming, has been appointed general manager of production, transmission and exploration for Mountain Fuel Supply Company, Rock Springs.

Nightingale has been with the company since its organization in 1929, and formerly in charge of lands and geology. He was made a vice president in 1940 and elected to the board of directors in 1942. He has been active in geological work in the Rocky Mountain area with The Ohio Oil Company and Mountain Fuel Suppply Company since 1926.

John R. Hertzler has been named vice president of York Corporation. A graduate of Lehigh University in 1927, Hertzler has spent his entire business career with York. In 1942 he accepted a commission in the Navy and held the rank of lieutenant commander when he was discharged recently.

H. G. Lawrence, formerly with Baker Oil Tools in the South Texas and California districts, has joined the W. L. Somner Company, Shreveport, as manager of industrial sales, specializing in industrial power units.

J. L. Singleton has been appointed manager for the 60 district offices of the Allis-Chalmers general machinery division's sales department.

Singleton joined Allis-Chalmers in 1926. He was granted a leave of absence to work as a power plant engineer for a large Chicago firm in 1928, returned to the Allis-Chalmers Denver district office, and was made district office manager there in 1938. He was transferred to the West Allis works as assistant to the manager of the steam turbine department in 1942 and became assistant manager seven months later.

C. R. Braun has been appointed supervisor of Allis-Chalmers' steam turbine department marine sales.

On joining Allis-Chalmers, Braun served in the engine and condenser department and in the general manufacturing department, later transferring to the steam turbine department.

James L. Geddes of the governmental sales division of Caterpillar Tractor Company, has been appointed representative in charge of the company's Washington, D. C., office.

Geddes joined the treasury department of "Caterpillar" three years ago and was placed in charge of the governmental section, later becoming eastern division credit manager. He recently was promoted to the governmental sales division and assumed his new duties in Washington October 15.

G. V. Woody has succeeded **R. C. Newhouse** as manager of the Allis-Chalmers basic industries department. Newhouse, who will be retained as a consulting engineer, retires after more than 40 years as engineer, inventor and designer of cement and mining machinery.

Woody has been manager of the Allis-Chalmers district office at Pittsburgh since 1934, although in 1941 and 1942 he served as administrator of the company's priorities management organization in Milwaukee.

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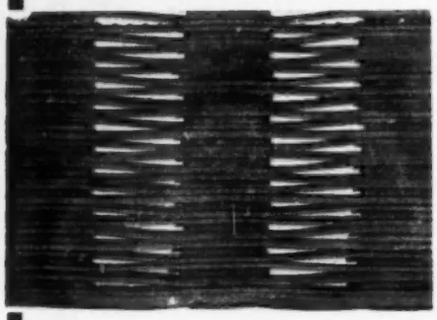

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Fig. F-658

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MEN IN THE INDUSTRY NEWS

George Livermore, accompanied by **Mrs. Livermore,** returned last week from a six weeks trip to South America by plane. Livermore visited the drilling operations of The Livermore Corporation for the Chilean government Compania de Fomento de la Produccion) in the Magellan district of Southern Chile, near Punta Arenas.

Edwin M. Perrin, advertising manager of Robins Conveyors, Inc., since May, 1942, has been promoted to assistant manager of equipment sales.

Cecil N. Cook, H. R. Funk and **C. D. Fitch,** all of Houston, have organized the Coastal Drilling Company with a capital stock of $10,000, and will maintain headquarters in Houston.

Earl C. Hankamer, Houston independent oil man, has been named a member of the Board of the Hermann Hospital Estate.

Marcus M. Chapman has been named manager of sales, sheet division, Carnegie-Illinois Steel Corporation. He succeeds **Howard V. Clark,** resigned.

William G. Hamilton has been promoted from assistant manager to manager of the American Meter Company's Philadelphia factory. He joined American Meter in 1927, engaging in factory production until 1937, when he was advanced to engineering and sales activities. He became assistant manager in 1941.

N. F. Adamson has been elected vice president in charge of sales and engineering of the Twin Disc Clutch Company, Racine, Wisconsin. He has been general sales manager for two years, and has been associated with the company more than two decades. **E. C. Billings** was named sales manager of the Racine division; **Roger G. DeLong** was appointed sales manager of the hydraulic division with headquarters at the company's Rockford, Illinois, plant; and **G. W. Buelke** was appointed chief engineer of the Racine division.

W. G. Green, president of Engineering Laboratories, Inc., has been elected president of Tulsa Industries, Inc., a cooperative venture engaged in promoting reconversion ventures for Tulsa manufacturers.

J. H. Poteet has joined **George O. Williams** in the Electrical Resistivity Surveys, Oklahoma City. He was formerly geologist with Kingwood Oil Company.

J. Lee Goodridge, formerly with Jones & Laughlin Supply Company, Tulsa, and **Ray Thorpe,** formerly with Cities Service Oil Company, Bartlesville, Oklahoma, have joined the sales force of the Moorlane Company and will cover the Tulsa trade territory.

Captain W. H. Drushel, formerly field foreman of the Conroe area for The Texas Company, has returned from military service and has been promoted to assistant superintendent of the South Central District of The Texas Company's South Texas Division of Production, with headquarters at Pierce, Texas. Captain Drushel was in the European War Theatre.

John Thompson, chief engineer of The Pipe Machinery Company, Cleveland, has established his residence in Phoenix, Arizona, where he will be sales representative for the company.

John B. Mensing, assistant treasurer of The National Supply Company, has been appointed general credit manager, replacing **Dana J. Fox,** who is resigning to become president of Fretz-Moon Tube Co. Mensing has been in the credit and treasury departments of National for over 25 years.

Deaths

H. S. Gurley, 71, pioneer Oklahoma oil man and attorney, died November 25 in a Blackwell, Oklahoma, hospital following a cerebral hemorrhage. He went to Blackwell in 1899, served as city attorney and wrote the city charter. He was instrumental in the discovery of the Deer Creek pool in Grant County.

Dr. E. H. Boomer, chairman of the Alberta, Canada, Conservation Board, died recently following a heart attack. He also was chairman of the Petroleum and Natural Gas Conservation Board and head of the chemistry department at the University of Alberta. Early this year Boomer went to Germany under Dominion auspices to study the oil industry there.

Walter Ellis Suggett died November 21 in Hobbs, New Mexico, following an accident on a drilling rig. Suggett, 24, recently had been discharged from the Army Air Corps after completing 35 missions during which he was shot down twice. He held the Presidential Unit Citation and the Air Medal with six oak leaf clusters. Before enlisting in the air corps he worked for The Pure Oil Company. His home was in Tulsa.

John McClain, who for the past ten years represented Clark Brothers Company, Inc., in Chicago, died at Knox, Indiana.

J. Ray McDermott of Houston, founder of the J. Ray McDermott general oil construction contractors, died November 27 in San Antonio.

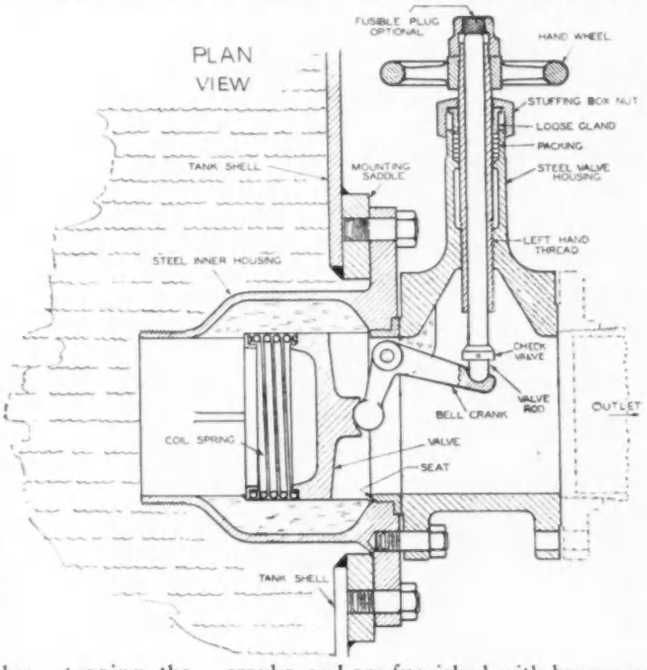
1—Internal Tank Valve

The Oceco Division of The Johnston & Jennings Company, Cleveland, Ohio, has developed the Oceco V-104 Internal Tank Valve to safeguard the contents of liquid storage tanks in event of line breakage. Use of the valve permits the flow to be shut off to make repairs or alterations in the line. The valve can be closed manually or automatically through the melting of the fusible plug, to prevent the tank contents from feeding a fire.

As illustrated, the valve is mounted on a saddle, which is welded to the tank shell. Turning the hand-wheel to the left forces the valve rod downward. This actuates the bell crank, pushing the valve inward, putting the spring under compression, and permitting the fluid to pass outward. Reversing the hand-wheel releases pressure on the spring, which reseats the valve, stopping the flow.

The fusible plug, furnished when desired, melts at critical temperature, releasing the valve rod and cutting off the flow automatically in case of fire.

The valves are easy to install, and since the working parts are mostly within the tank, they are protected from all but the coldest weather. The valves have steel bodies, valve rods and bell cranks, and are furnished with bronze or stainless steel trim, without or with the fusible plug. Sizes include 4, 6, 8, and 10-inch as standard, but special sizes can be obtained.



2—Meter

Macbeth Corporation, New York, has perfected the Macbeth Line-operated pH Meter, the simplicity of which is said to make possible the use of adequate pH control in many operations, which up to the present time is not performed due to the high cost and complexity of meter operation.

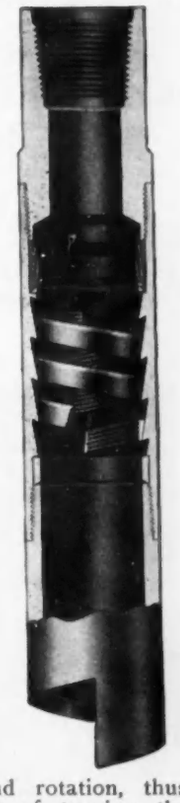
The meter can be used by workmen and assistant technicians as well as chemists, since minimum experience is necessary for obtaining pH readings. Only one control in addition to the electrode switch is used. pH values are read directly on the scale in .1 units over the full range of 0-14 pH.

3—Electroplating

Bart Manufacturing Company, Belleville, New Jersey, announced the perfection of a method of electroplating the inside of steel pipe with nickel so that highly corrosive fluids can be handled. By placing all the nickel on the surface of the inside of the pipe, costly alloys are no longer necessary, it is claimed.

4—Bowen Overshot

S. R. Bowen Company, Huntington Beach, California, announces the new compact series 150 Bowen Overshot, designed for use where a small, single bowl overshot is desired for catching one specific size of pipe, tool joint, coupling or drill collar. The small outside diameter of this tool enables it to be used under tight-hole conditions that would normally eliminate an outside releasing fishing tool, yet it is so designed that strength of the bowl is not sacrificed for sake of small diameter.



Construction of the Series 150 makes use of the unique helical grapple that takes a full-length, full-circumferential grip around the pipe, a grip that cinches tighter as upward pull increases, yet releases easily whenever required. A means for packing off around the fish is provided so that circulation can be established.

An important feature of the tool is that it both sets and releases on right-hand rotation, thus avoiding the dangers of turning the string in an unscrewing direction. Right

THE OIL WEEKLY
P. O. Box 2608, Houston 1, Texas, U.S.A.

Please have manufacturers send me, without obligation, more information on items shown in December 3 issue of The OIL WEEKLY as checked below:

1	2	3	4	5	6	7	8	9	10	11	12
13	14	15	16	17	18	19	20	21	22	23	24

In addition to information checked above, I would like more data on products or services advertised elsewhere in this issue by_____ Company

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(To avoid delay PRINT or TYPE clearly name, company and mailing address)

hand rotation of the string expands the grapples as the tool is simultaneously lowered over the fish, and simply allowing rotation to stop causes the grapple to hold around the fish. Thereafter when upward pull is exerted the hold is secure, since the overshot takes hold as soon as it is over the fish. Release is easily effected by first bumping down to break the hold and then turning the run-in string to the right to again expand the grapple, and at the same time slowly raising the string until the overshot is clear of the fish.

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PAGES 3079 THRU 3098 IN THE COMPOSITE CATALOG

BE SURE TO CHECK THE
TRADING POST SECTION
ON PAGE 79 OF THIS ISSUE

5—Detector

Shell Development Company, Inc., 50 West Fiftieth Street, New York, announces the "Probolog," used for inspection of tubular equipment. This instrument, used principally for detecting flaws in the metal tubes of heat exchanger equipment, is portable and can be operated by one man while the heat exchanger tubes are in place. It may be operated either as an indicator or recorder, and the records can be retained for comparison with those of other tubes or with those from earlier inspections of the same tube.

The instrument consists essentially of three parts: (1) one or more probes to fit standard sizes of tubing, (2) a mechanical probe puller usually synchronized with the chart drive of the recorder so as to insure a reproducible record, and (3) an electronic recorder, equipped with a continuous strip chart but also incorporating a neon blinker which may be used as an indicator when a record is not required.

The instrument is run as rapidly as possible through a bundle of tubes, with the recorder cut out, then rerun to obtain a record on those tubes which the neon blinker indicates to be defective.

The present instrument is designed specifically for the inspection of nonmagnetic tubes including copper, brass, monel, Admiralty metal, copper-nickel, aluminum, magnesium, and stainless steels. For basic reasons it is unsuitable for the examination of steel tubes.

6—Fire Extinguisher

The B. F. Goodrich Company, Akron, Ohio, announces a new carbon dioxide hand fire extinguisher said to be of unique design and featuring quick operation.

Made to meet the full approval of fire underwriters, the container holds four pounds of carbon dioxide and comes with a carrying handle and control button designed for fast operation. It can be carried easily in one hand, with the thumb of the carrying hand operating the push button. A horn swivel quickly raises or lowers as needed, remaining in lower position when attached to the wall rack furnished with each extinguisher, together with a quick release chain.

Use the Coupon

For free copies of Manufacturers' Literature or more information on products described on these pages, use the convenient mailing coupon on page 85.

Literature

7—Gate Valves

Everlasting Valve Company, Jersey City, New Jersey, has published a 16-page bulletin describing latest developments in lever-operated gate valves and showing industrial and process line applications. The bulletin, E-150, describes in detail the features of the valves, including their quick action, straight-through flow, leak-tight seal, and self-grinding of the sealing surfaces.

8—Deaeration

The Elliott Company, Jeanette, Pennsylvania, has issued a 20-page booklet on the science of deaeration and its effectiveness in controlling corrosion. Fully illustrated with charts and photographs, the booklet describes corrosion in general and the part which deaeration plays in checking it. Included in the text is a table showing the derivation of the pH factor and a graph indicating the effect of pH on the rate of corrosion.

Happy Surprise for Failing Employes

Upon their return from the armed services, employes of George E. Failing Supply Company, Enid, Oklahoma, and Houston, are called to the office of Robert Greer, treasurer, and purchasing agent, and handed a package of war bonds purchased for them by the company during their absence.

The policy of buying a bond a month for Failing employes in the services was instituted in June, 1943. Lucky recipients of the bonds do not learn about the purchases until they report back after receiving their discharge. Above, Capt. Joel E. Yarborough, member of the Failing engineering staff, is shown receiving his surpsise package from Greer, while Failing watches the happy proceedings. Capt. Yarborough received $1125 in bonds.

United Oilwell Organizes Service Firm in Venezuela

United Oilwell Service, S.A. of Caracas, Venezuela, has announced the organization of a service company which will offer many of the services currently being performed by Dowell Incorporated of Tulsa.

The first such service will be acidizing of oil wells with the principal base of operations at Km. 100 on the Barcelona-SanTome Road, at which point United Oilwell Service is constructing a modern camp, laboratory, warehouse and shops.

The procedure for acidizing wells will be carried out under a licensing agreement between United Oilwell Service, S.A. and Dow Chemical Company.

As soon as possible, United Oilwell Service plans to expand its services to include the use of plastics in water shut-offs, the use of the Dowell Electric Pilot for determining relative permeabilities in oil wells, water locating apparatus, and mud engineering.

Plans are also being made for the extension of these services to the Maracaibo area.

General offices of United Oilwell Service, S.A. are located in Caracas, with Charles W. Fowler president and general manager and Phil J. Lehnhard, formerly of Dowell Incorporated, chief engineer.

Aireon Purchases Midco and Plans Facilities Expansion

Aireon Manufacturing Corporation, of Kansas City, Kansas, recently purchased the Midco Tool and Supply Company of Oklahoma City and has announced considerable expansion of plant facilities and the trade territory to be covered.

Randolph C. Walker, president of Aireon, has announced that William F. Bonner, general manager of Midco, and Dr. C. P. Bondurant, both of Oklahoma City, have been added to the board of directors. Other Midco directors are B. D. Craig and A. E. Welch, of Kansas City.

Midco's plant in Oklahoma City will be enlarged to twice the present size and company representatives will be placed in Texas, Colorado and California. Outlets in the Illinois basin and in the Mid-Continent also will be enlarged.

Bovaird Meeting Held

The Bovaird Supply Company held its 75th annual meeting at Tulsa November 26-27 with officers, directors and stockholders in attendance. The company was organized in 1871 and is the third oldest oil well equipment dealer in the world.

Among those in attendance were W. M. Bovaird, president; F. D. Bovaird and D. M. Bradley, vice presidents; D. D. Bovaird, treasurer; R. M. McMahan, secretary; S. J. Raphel, manager of tubular sales; Charles Meyer, district manager, and D. W. Cunningham, special representative, both of Oklahoma City; C. A. Black, district manager, Wichita, Kansas; Dale C. Osmer, store manager, McPherson, Kansas; W. J. Miller, store manager, Pratt, Kansas; R. W. Robbins, store manager, Russell, Kansas; R. E. Batchelor, store manager, Chase, Kansas; P. E. Whitten, store manager, Borger, Texas; D. C. Kennedy, district manager, Pampa, Texas; C. E. Pearson, store manager, Salem, Illinois; L. W. Bartheld, district manager, Mt. Vernon, Illinois; J. B. Hubbard, store manager, Sapulpa, Oklahoma; Clyde Stapleton, store manager, Seminole, Oklahoma.

An A.A.P.G. Publication!

TECTONIC MAP of the UNITED STATES 1944

Prepared under the Direction of the Committee on Tectonics, Division of Geology and Geography, National Research Council.
Chester R. Longwell, Chairman, Philip B. King, Vice-Chairman.
Charles H. Behre, Walter H. Bucher, Eugene Callaghan, D. F. Hewett, G. Marshall Kay, Eleanora B. Knopf, A. I. Levorsen, T. S. Lovering, George R. Mansfield, Watson H. Monroe, J. T. Pardee, Ralph D. Reed, George W. Stose, W. T. Thom, Jr., A. C. Waters, Eldred D. Wilson, A. O. Woodford.

A NEW GEOLOGIC MAP OF THE UNITED STATES AND ADJACENT PARTS OF CANADA AND MEXICO

Geologic structure, as evidenced and interpreted by a combination of outcropping areas, bedrock, surface disturbance, and subsurface deformation, is indicated by colors, symbols, contours, and descriptive explanation. Igneous, metamorphic, and selected areas of sedimentary rock are mapped. Salt domes, crypto-Volcanic disturbances, and submarine contours are shown. The base map shows state boundaries, rivers, a pattern of cities, and 1-degree lines of latitude and longitude.

The scale is 1:2,500,000, or 1 inch equals 40 miles. Printed in 7 colors on 2 sheets, each about 40 x 50 inches. Full map size is about 80 x 50 inches.

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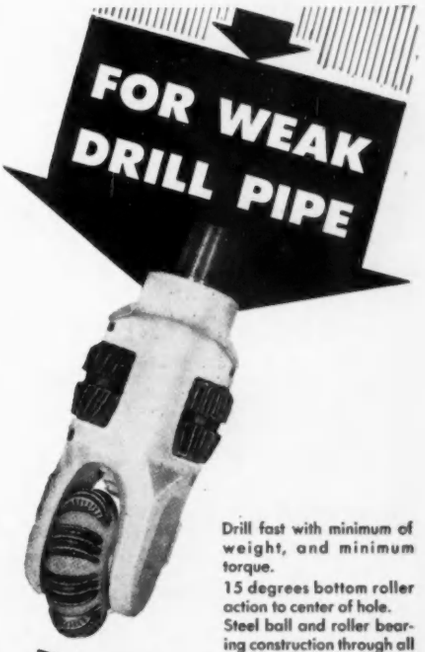

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New Approach to Geologic Thinking Given by Hubbert

In an illustrated address titled "Geologic Inventions" before the Houston Geological Society, November 26th, Dr. M. King Hubbert, associate director of research for exploration, Shell Oil Company, Inc., introduced a new approach to geologic thinking in the establishment of mathematical analysis to problems of terrestrial phenomena, indicating that it is possible to set up hard and fast physical laws in the study of geologic processes, comparable with the principles underlying the studies of other sciences, such as physics..

Hubbert, an authority on the physics of terrestrial phenomena and the theory of scale models, joined the Shell organization in 1943 after a distinguished career as a geologist and geophysicist, and with Director Harold Gershinowitz, is connected with the Shell's new million dollar exploration and production laboratory now in the process of construction in Houston.

With a preliminary background of mathematical reasoning Hubbert examined several current geologic ideas in the field of ground water dynamics proving that many prevalent conceptions of geologic processes are contrary to fact, implying that the lack of critical examination of many geologic ideas has allowed many erroneous hypotheses to be intrenched into the world's geologic literature.

Turning to problems affecting the Gulf Coast, Hubbert examined the forces operating in the relation of the unloading of sedimentation into the Gulf of Mexico and the Gulf Coast geosyncline, showing that the simple denudation of the Gulf continental mass was not in itself the correct explanation for structural conceptions of the Gulf basin, as hitherto believed. He closed the address with a demonstration of scale model technique on stresses affecting the structural conceptions of the Appalachian geosyncline, showing that previous textbook ideas on the conception of overthrust movements were faulty in not taking into consideration all factors of physics involved in complex structural movements in the region.

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